

# PEST RUN RECORD: CASE mfit

PEST Version: 16.1

PEST run mode:-

Parameter estimation mode

Case dimensions:-

Number of parameters	:	4
Number of adjustable parameters	:	4
Number of parameter groups	:	1
Number of observations	:	500
Number of prior estimates	:	0

Model command line(s):-

MDP\_2RNE

Jacobian command line:-

MDP\_2RNE /d  
Jacobian read from file Deriv.txt  
This is an ASCII file.

Model interface files:-

Templates:  
MFIT.tpl  
for model input files:  
Input.txt  
  
(Parameter values written using single precision protocol.)  
(Decimal point always included.)  
  
Instruction files:  
MFIT.ins  
for reading model output files:  
Output.txt

PEST-to-model message file:-

na

Singular value decomposition:-

Perform SVD on $XtQX$ or $Q^{(1/2)}X$	:	$Q^{(1/2)}X$
Max. number of singular values to employ	:	4
Ratio of lowest/highest singular value	:	5.000000E-07
Record eigenvectors in SVD file	:	yes

Derivatives calculation:-

Param group	Increment type	Increment	Increment low bound	Forward or central switch	Multiplier (central)	Method (central)
pgnam	relative	1.0000E-02	none		1.500	parabolic

Parameter definitions:-

Name	Trans-formation	Change limit	Initial value	Lower bound	Upper bound
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74	h1	log	factor	40.0000	30.0000	50.0000
75	s1	log	factor	250.000	1.00000	5000.00
76	p1	log	factor	0.900000	0.100000	0.999000
77	o1	log	factor	1.000000E-05	1.000000E-10	1.000000E-02
78						
79	Name	Group	Scale	Offset	Model command number	
80	h1	pgram	1.00000	0.00000	1	
81	s1	pgram	1.00000	0.00000	0	
82	p1	pgram	1.00000	0.00000	1	
83	o1	pgram	1.00000	0.00000	0	
84						
85						
86	Prior information:-					
87						
88	No prior information supplied					
89						
90						
91	Observations:-					
92						
93	Observation name	Observation	Weight	Group		
94	o1	2.590000E-08	1.000	conc		
95	o2	6.041790E-08	1.000	conc		
96	o3	7.045510E-08	1.000	conc		
97	o4	6.061850E-08	1.000	conc		
98	o5	4.035480E-08	1.000	conc		
99	o6	1.840630E-08	1.000	conc		
100	o7	2.862080E-09	1.000	conc		
101	o8	1.398620E-09	1.000	conc		
102	o9	1.242340E-08	1.000	conc		
103	o10	2.511130E-08	1.000	conc		
104	o11	2.840230E-08	1.000	conc		
105	o12	1.623870E-08	1.000	conc		
106	o13	1.391590E-09	1.000	conc		
107	o14	0.00000	1.000	conc		
108	o15	8.042150E-09	1.000	conc		
109	o16	2.323690E-08	1.000	conc		
110	o17	3.486020E-08	1.000	conc		
111	o18	3.221440E-08	1.000	conc		
112	o19	2.012160E-08	1.000	conc		
113	o20	1.820490E-08	1.000	conc		
114	o21	2.995640E-08	1.000	conc		
115	o22	3.351660E-08	1.000	conc		
116	o23	1.735370E-08	1.000	conc		
117	o24	0.00000	1.000	conc		
118	o25	0.00000	1.000	conc		
119	o26	1.827050E-09	1.000	conc		
120	o27	0.00000	1.000	conc		
121	o28	2.878970E-09	1.000	conc		
122	o29	2.847040E-08	1.000	conc		
123	o30	5.884060E-08	1.000	conc		
124	o31	5.537600E-08	1.000	conc		
125	o32	2.838700E-08	1.000	conc		
126	o33	3.754250E-08	1.000	conc		
127	o34	9.696690E-08	1.000	conc		
128	o35	1.449780E-07	1.000	conc		
129	o36	1.388220E-07	1.000	conc		
130	o37	1.008400E-07	1.000	conc		
131	o38	6.353650E-08	1.000	conc		
132	o39	5.595610E-08	1.000	conc		
133	o40	6.928060E-08	1.000	conc		
134	o41	7.249730E-08	1.000	conc		
135	o42	5.923150E-08	1.000	conc		
136	o43	4.597250E-08	1.000	conc		
137	o44	4.046490E-08	1.000	conc		
138	o45	4.299730E-08	1.000	conc		
139	o46	4.403430E-08	1.000	conc		
140	o47	4.280100E-08	1.000	conc		
141	o48	5.510130E-08	1.000	conc		
142	o49	7.098810E-08	1.000	conc		
143	o50	6.257670E-08	1.000	conc		
144	o51	3.340120E-08	1.000	conc		
145	o52	2.130400E-09	1.000	conc		
146	o53	1.315980E-08	1.000	conc		

147	o54	1.742090E-07	1.000	conc
148	o55	6.601930E-07	1.000	conc
149	o56	1.501590E-06	1.000	conc
150	o57	2.390120E-06	1.000	conc
151	o58	3.116340E-06	1.000	conc
152	o59	4.010250E-06	1.000	conc
153	o60	5.504160E-06	1.000	conc
154	o61	7.889550E-06	1.000	conc
155	o62	1.136910E-05	1.000	conc
156	o63	1.576620E-05	1.000	conc
157	o64	2.067220E-05	1.000	conc
158	o65	2.567570E-05	1.000	conc
159	o66	3.036650E-05	1.000	conc
160	o67	3.434180E-05	1.000	conc
161	o68	3.721140E-05	1.000	conc
162	o69	3.871450E-05	1.000	conc
163	o70	3.889650E-05	1.000	conc
164	o71	3.799760E-05	1.000	conc
165	o72	3.684470E-05	1.000	conc
166	o73	3.620540E-05	1.000	conc
167	o74	3.552260E-05	1.000	conc
168	o75	3.381830E-05	1.000	conc
169	o76	3.141060E-05	1.000	conc
170	o77	2.941670E-05	1.000	conc
171	o78	2.819400E-05	1.000	conc
172	o79	2.731840E-05	1.000	conc
173	o80	2.593800E-05	1.000	conc
174	o81	2.274050E-05	1.000	conc
175	o82	1.876040E-05	1.000	conc
176	o83	1.644770E-05	1.000	conc
177	o84	1.546030E-05	1.000	conc
178	o85	1.447720E-05	1.000	conc
179	o86	1.325630E-05	1.000	conc
180	o87	1.213110E-05	1.000	conc
181	o88	1.106710E-05	1.000	conc
182	o89	1.003450E-05	1.000	conc
183	o90	9.242660E-06	1.000	conc
184	o91	8.848360E-06	1.000	conc
185	o92	8.809330E-06	1.000	conc
186	o93	8.093760E-06	1.000	conc
187	o94	7.046590E-06	1.000	conc
188	o95	7.096300E-06	1.000	conc
189	o96	6.642990E-06	1.000	conc
190	o97	6.279300E-06	1.000	conc
191	o98	6.008520E-06	1.000	conc
192	o99	5.694840E-06	1.000	conc
193	o100	5.320280E-06	1.000	conc
194	o101	4.943720E-06	1.000	conc
195	o102	4.579720E-06	1.000	conc
196	o103	4.272880E-06	1.000	conc
197	o104	4.106740E-06	1.000	conc
198	o105	3.955550E-06	1.000	conc
199	o106	3.762510E-06	1.000	conc
200	o107	3.487950E-06	1.000	conc
201	o108	3.157850E-06	1.000	conc
202	o109	3.073580E-06	1.000	conc
203	o110	3.123350E-06	1.000	conc
204	o111	2.972620E-06	1.000	conc
205	o112	2.396930E-06	1.000	conc
206	o113	2.161300E-06	1.000	conc
207	o114	2.331570E-06	1.000	conc
208	o115	2.195760E-06	1.000	conc
209	o116	2.013480E-06	1.000	conc
210	o117	1.992600E-06	1.000	conc
211	o118	2.067110E-06	1.000	conc
212	o119	2.024050E-06	1.000	conc
213	o120	1.793380E-06	1.000	conc
214	o121	1.735330E-06	1.000	conc
215	o122	1.782960E-06	1.000	conc
216	o123	1.637310E-06	1.000	conc
217	o124	1.542970E-06	1.000	conc
218	o125	1.594510E-06	1.000	conc
219	o126	1.661020E-06	1.000	conc

220	o127	1.640720E-06	1.000	conc
221	o128	1.554100E-06	1.000	conc
222	o129	1.449310E-06	1.000	conc
223	o130	1.372540E-06	1.000	conc
224	o131	1.335330E-06	1.000	conc
225	o132	1.319800E-06	1.000	conc
226	o133	1.307100E-06	1.000	conc
227	o134	1.279690E-06	1.000	conc
228	o135	1.235570E-06	1.000	conc
229	o136	1.183070E-06	1.000	conc
230	o137	1.130690E-06	1.000	conc
231	o138	1.085970E-06	1.000	conc
232	o139	1.054120E-06	1.000	conc
233	o140	1.040060E-06	1.000	conc
234	o141	1.047440E-06	1.000	conc
235	o142	1.067610E-06	1.000	conc
236	o143	1.084930E-06	1.000	conc
237	o144	1.083670E-06	1.000	conc
238	o145	1.051100E-06	1.000	conc
239	o146	9.960480E-07	1.000	conc
240	o147	9.367260E-07	1.000	conc
241	o148	8.912290E-07	1.000	conc
242	o149	8.673420E-07	1.000	conc
243	o150	8.570490E-07	1.000	conc
244	o151	8.509940E-07	1.000	conc
245	o152	8.410760E-07	1.000	conc
246	o153	8.267230E-07	1.000	conc
247	o154	8.101600E-07	1.000	conc
248	o155	7.936160E-07	1.000	conc
249	o156	7.787460E-07	1.000	conc
250	o157	7.646170E-07	1.000	conc
251	o158	7.495700E-07	1.000	conc
252	o159	7.320050E-07	1.000	conc
253	o160	7.117650E-07	1.000	conc
254	o161	6.901710E-07	1.000	conc
255	o162	6.686150E-07	1.000	conc
256	o163	6.488390E-07	1.000	conc
257	o164	6.339230E-07	1.000	conc
258	o165	6.272630E-07	1.000	conc
259	o166	6.322520E-07	1.000	conc
260	o167	6.483740E-07	1.000	conc
261	o168	6.640750E-07	1.000	conc
262	o169	6.717990E-07	1.000	conc
263	o170	6.722490E-07	1.000	conc
264	o171	6.667270E-07	1.000	conc
265	o172	6.565360E-07	1.000	conc
266	o173	6.429800E-07	1.000	conc
267	o174	6.273620E-07	1.000	conc
268	o175	6.109860E-07	1.000	conc
269	o176	5.948490E-07	1.000	conc
270	o177	5.787370E-07	1.000	conc
271	o178	5.621310E-07	1.000	conc
272	o179	5.445970E-07	1.000	conc
273	o180	5.274260E-07	1.000	conc
274	o181	5.135020E-07	1.000	conc
275	o182	5.057720E-07	1.000	conc
276	o183	5.056420E-07	1.000	conc
277	o184	5.093550E-07	1.000	conc
278	o185	5.120720E-07	1.000	conc
279	o186	5.089570E-07	1.000	conc
280	o187	4.979250E-07	1.000	conc
281	o188	4.838970E-07	1.000	conc
282	o189	4.728920E-07	1.000	conc
283	o190	4.702190E-07	1.000	conc
284	o191	4.733380E-07	1.000	conc
285	o192	4.748510E-07	1.000	conc
286	o193	4.673070E-07	1.000	conc
287	o194	4.478510E-07	1.000	conc
288	o195	4.235710E-07	1.000	conc
289	o196	4.028560E-07	1.000	conc
290	o197	3.940200E-07	1.000	conc
291	o198	3.997040E-07	1.000	conc
292	o199	4.130600E-07	1.000	conc

293	o200	4.263430E-07	1.000	conc
294	o201	4.326460E-07	1.000	conc
295	o202	4.306550E-07	1.000	conc
296	o203	4.213290E-07	1.000	conc
297	o204	4.056960E-07	1.000	conc
298	o205	3.878020E-07	1.000	conc
299	o206	3.760210E-07	1.000	conc
300	o207	3.790600E-07	1.000	conc
301	o208	4.048110E-07	1.000	conc
302	o209	4.380700E-07	1.000	conc
303	o210	4.505410E-07	1.000	conc
304	o211	4.448250E-07	1.000	conc
305	o212	4.285460E-07	1.000	conc
306	o213	4.093090E-07	1.000	conc
307	o214	3.923830E-07	1.000	conc
308	o215	3.785030E-07	1.000	conc
309	o216	3.678840E-07	1.000	conc
310	o217	3.606130E-07	1.000	conc
311	o218	3.557500E-07	1.000	conc
312	o219	3.518660E-07	1.000	conc
313	o220	3.475430E-07	1.000	conc
314	o221	3.421740E-07	1.000	conc
315	o222	3.365050E-07	1.000	conc
316	o223	3.314100E-07	1.000	conc
317	o224	3.277660E-07	1.000	conc
318	o225	3.266420E-07	1.000	conc
319	o226	3.293540E-07	1.000	conc
320	o227	3.372350E-07	1.000	conc
321	o228	3.503730E-07	1.000	conc
322	o229	3.627350E-07	1.000	conc
323	o230	3.664120E-07	1.000	conc
324	o231	3.538240E-07	1.000	conc
325	o232	3.267250E-07	1.000	conc
326	o233	2.972220E-07	1.000	conc
327	o234	2.779620E-07	1.000	conc
328	o235	2.807770E-07	1.000	conc
329	o236	3.027670E-07	1.000	conc
330	o237	3.282720E-07	1.000	conc
331	o238	3.412080E-07	1.000	conc
332	o239	3.313560E-07	1.000	conc
333	o240	3.067770E-07	1.000	conc
334	o241	2.790880E-07	1.000	conc
335	o242	2.593120E-07	1.000	conc
336	o243	2.500270E-07	1.000	conc
337	o244	2.475120E-07	1.000	conc
338	o245	2.478980E-07	1.000	conc
339	o246	2.476030E-07	1.000	conc
340	o247	2.459700E-07	1.000	conc
341	o248	2.440310E-07	1.000	conc
342	o249	2.428400E-07	1.000	conc
343	o250	2.429470E-07	1.000	conc
344	o251	2.438980E-07	1.000	conc
345	o252	2.451130E-07	1.000	conc
346	o253	2.460160E-07	1.000	conc
347	o254	2.460300E-07	1.000	conc
348	o255	2.445760E-07	1.000	conc
349	o256	2.410770E-07	1.000	conc
350	o257	2.349560E-07	1.000	conc
351	o258	2.256350E-07	1.000	conc
352	o259	2.127040E-07	1.000	conc
353	o260	1.975550E-07	1.000	conc
354	o261	1.826670E-07	1.000	conc
355	o262	1.705390E-07	1.000	conc
356	o263	1.636690E-07	1.000	conc
357	o264	1.644490E-07	1.000	conc
358	o265	1.726930E-07	1.000	conc
359	o266	1.855120E-07	1.000	conc
360	o267	1.998920E-07	1.000	conc
361	o268	2.128170E-07	1.000	conc
362	o269	2.212710E-07	1.000	conc
363	o270	2.227080E-07	1.000	conc
364	o271	2.176220E-07	1.000	conc
365	o272	2.077180E-07	1.000	conc

366	o273	1.947020E-07	1.000	conc
367	o274	1.802810E-07	1.000	conc
368	o275	1.661270E-07	1.000	conc
369	o276	1.534240E-07	1.000	conc
370	o277	1.430190E-07	1.000	conc
371	o278	1.357500E-07	1.000	conc
372	o279	1.324550E-07	1.000	conc
373	o280	1.339740E-07	1.000	conc
374	o281	1.405780E-07	1.000	conc
375	o282	1.502300E-07	1.000	conc
376	o283	1.603050E-07	1.000	conc
377	o284	1.681780E-07	1.000	conc
378	o285	1.712250E-07	1.000	conc
379	o286	1.672560E-07	1.000	conc
380	o287	1.574450E-07	1.000	conc
381	o288	1.445270E-07	1.000	conc
382	o289	1.312480E-07	1.000	conc
383	o290	1.203520E-07	1.000	conc
384	o291	1.145800E-07	1.000	conc
385	o292	1.155330E-07	1.000	conc
386	o293	1.218370E-07	1.000	conc
387	o294	1.316430E-07	1.000	conc
388	o295	1.431010E-07	1.000	conc
389	o296	1.543620E-07	1.000	conc
390	o297	1.637930E-07	1.000	conc
391	o298	1.708000E-07	1.000	conc
392	o299	1.751040E-07	1.000	conc
393	o300	1.764210E-07	1.000	conc
394	o301	1.744710E-07	1.000	conc
395	o302	1.689780E-07	1.000	conc
396	o303	1.601270E-07	1.000	conc
397	o304	1.488840E-07	1.000	conc
398	o305	1.362920E-07	1.000	conc
399	o306	1.233950E-07	1.000	conc
400	o307	1.112360E-07	1.000	conc
401	o308	1.008570E-07	1.000	conc
402	o309	9.328990E-08	1.000	conc
403	o310	8.893630E-08	1.000	conc
404	o311	8.728010E-08	1.000	conc
405	o312	8.773220E-08	1.000	conc
406	o313	8.970370E-08	1.000	conc
407	o314	9.260560E-08	1.000	conc
408	o315	9.584880E-08	1.000	conc
409	o316	9.884430E-08	1.000	conc
410	o317	1.011340E-07	1.000	conc
411	o318	1.028180E-07	1.000	conc
412	o319	1.041430E-07	1.000	conc
413	o320	1.053590E-07	1.000	conc
414	o321	1.067130E-07	1.000	conc
415	o322	1.084520E-07	1.000	conc
416	o323	1.108260E-07	1.000	conc
417	o324	1.140510E-07	1.000	conc
418	o325	1.178980E-07	1.000	conc
419	o326	1.217920E-07	1.000	conc
420	o327	1.251530E-07	1.000	conc
421	o328	1.273980E-07	1.000	conc
422	o329	1.279450E-07	1.000	conc
423	o330	1.262120E-07	1.000	conc
424	o331	1.216930E-07	1.000	conc
425	o332	1.147900E-07	1.000	conc
426	o333	1.064960E-07	1.000	conc
427	o334	9.781810E-08	1.000	conc
428	o335	8.976220E-08	1.000	conc
429	o336	8.333400E-08	1.000	conc
430	o337	7.953930E-08	1.000	conc
431	o338	7.937580E-08	1.000	conc
432	o339	8.310890E-08	1.000	conc
433	o340	8.970640E-08	1.000	conc
434	o341	9.800290E-08	1.000	conc
435	o342	1.068330E-07	1.000	conc
436	o343	1.150320E-07	1.000	conc
437	o344	1.214330E-07	1.000	conc
438	o345	1.248720E-07	1.000	conc

439	o346	1.244490E-07	1.000	conc
440	o347	1.206740E-07	1.000	conc
441	o348	1.145190E-07	1.000	conc
442	o349	1.069590E-07	1.000	conc
443	o350	9.896780E-08	1.000	conc
444	o351	9.151880E-08	1.000	conc
445	o352	8.558610E-08	1.000	conc
446	o353	8.210600E-08	1.000	conc
447	o354	8.126640E-08	1.000	conc
448	o355	8.256360E-08	1.000	conc
449	o356	8.546820E-08	1.000	conc
450	o357	8.945030E-08	1.000	conc
451	o358	9.398060E-08	1.000	conc
452	o359	9.852930E-08	1.000	conc
453	o360	1.025670E-07	1.000	conc
454	o361	1.056860E-07	1.000	conc
455	o362	1.077830E-07	1.000	conc
456	o363	1.088070E-07	1.000	conc
457	o364	1.087020E-07	1.000	conc
458	o365	1.074160E-07	1.000	conc
459	o366	1.048950E-07	1.000	conc
460	o367	1.010860E-07	1.000	conc
461	o368	9.611800E-08	1.000	conc
462	o369	9.050930E-08	1.000	conc
463	o370	8.482960E-08	1.000	conc
464	o371	7.964840E-08	1.000	conc
465	o372	7.553540E-08	1.000	conc
466	o373	7.306010E-08	1.000	conc
467	o374	7.279220E-08	1.000	conc
468	o375	7.514010E-08	1.000	conc
469	o376	7.944540E-08	1.000	conc
470	o377	8.461630E-08	1.000	conc
471	o378	8.955980E-08	1.000	conc
472	o379	9.318290E-08	1.000	conc
473	o380	9.439240E-08	1.000	conc
474	o381	9.209550E-08	1.000	conc
475	o382	8.524380E-08	1.000	conc
476	o383	7.405490E-08	1.000	conc
477	o384	6.015780E-08	1.000	conc
478	o385	4.525560E-08	1.000	conc
479	o386	3.105130E-08	1.000	conc
480	o387	1.924800E-08	1.000	conc
481	o388	1.154880E-08	1.000	conc
482	o389	9.269960E-09	1.000	conc
483	o390	1.192830E-08	1.000	conc
484	o391	1.851730E-08	1.000	conc
485	o392	2.803040E-08	1.000	conc
486	o393	3.946100E-08	1.000	conc
487	o394	5.180260E-08	1.000	conc
488	o395	6.404870E-08	1.000	conc
489	o396	7.522440E-08	1.000	conc
490	o397	8.488610E-08	1.000	conc
491	o398	9.302900E-08	1.000	conc
492	o399	9.966150E-08	1.000	conc
493	o400	1.047920E-07	1.000	conc
494	o401	1.084280E-07	1.000	conc
495	o402	1.105790E-07	1.000	conc
496	o403	1.112630E-07	1.000	conc
497	o404	1.106210E-07	1.000	conc
498	o405	1.088860E-07	1.000	conc
499	o406	1.062910E-07	1.000	conc
500	o407	1.030690E-07	1.000	conc
501	o408	9.945440E-08	1.000	conc
502	o409	9.568040E-08	1.000	conc
503	o410	9.197960E-08	1.000	conc
504	o411	8.849010E-08	1.000	conc
505	o412	8.516850E-08	1.000	conc
506	o413	8.195060E-08	1.000	conc
507	o414	7.877250E-08	1.000	conc
508	o415	7.557000E-08	1.000	conc
509	o416	7.227910E-08	1.000	conc
510	o417	6.883580E-08	1.000	conc
511	o418	6.520510E-08	1.000	conc

512	o419	6.152120E-08	1.000	conc
513	o420	5.797910E-08	1.000	conc
514	o421	5.477390E-08	1.000	conc
515	o422	5.210060E-08	1.000	conc
516	o423	5.015430E-08	1.000	conc
517	o424	4.913010E-08	1.000	conc
518	o425	4.914850E-08	1.000	conc
519	o426	4.996780E-08	1.000	conc
520	o427	5.123580E-08	1.000	conc
521	o428	5.260070E-08	1.000	conc
522	o429	5.372650E-08	1.000	conc
523	o430	5.452150E-08	1.000	conc
524	o431	5.508430E-08	1.000	conc
525	o432	5.551840E-08	1.000	conc
526	o433	5.592730E-08	1.000	conc
527	o434	5.641470E-08	1.000	conc
528	o435	5.708410E-08	1.000	conc
529	o436	5.803860E-08	1.000	conc
530	o437	5.931950E-08	1.000	conc
531	o438	6.083730E-08	1.000	conc
532	o439	6.248570E-08	1.000	conc
533	o440	6.415840E-08	1.000	conc
534	o441	6.574900E-08	1.000	conc
535	o442	6.715150E-08	1.000	conc
536	o443	6.825940E-08	1.000	conc
537	o444	6.897850E-08	1.000	conc
538	o445	6.929210E-08	1.000	conc
539	o446	6.921410E-08	1.000	conc
540	o447	6.875870E-08	1.000	conc
541	o448	6.793980E-08	1.000	conc
542	o449	6.677160E-08	1.000	conc
543	o450	6.526820E-08	1.000	conc
544	o451	6.346600E-08	1.000	conc
545	o452	6.152200E-08	1.000	conc
546	o453	5.963400E-08	1.000	conc
547	o454	5.799960E-08	1.000	conc
548	o455	5.681660E-08	1.000	conc
549	o456	5.628270E-08	1.000	conc
550	o457	5.659560E-08	1.000	conc
551	o458	5.793820E-08	1.000	conc
552	o459	6.018830E-08	1.000	conc
553	o460	6.293640E-08	1.000	conc
554	o461	6.576190E-08	1.000	conc
555	o462	6.824420E-08	1.000	conc
556	o463	6.996260E-08	1.000	conc
557	o464	7.049670E-08	1.000	conc
558	o465	6.942630E-08	1.000	conc
559	o466	6.658270E-08	1.000	conc
560	o467	6.244930E-08	1.000	conc
561	o468	5.761370E-08	1.000	conc
562	o469	5.266350E-08	1.000	conc
563	o470	4.818620E-08	1.000	conc
564	o471	4.476960E-08	1.000	conc
565	o472	4.300000E-08	1.000	conc
566	o473	4.321500E-08	1.000	conc
567	o474	4.520450E-08	1.000	conc
568	o475	4.868480E-08	1.000	conc
569	o476	5.337270E-08	1.000	conc
570	o477	5.898460E-08	1.000	conc
571	o478	6.523700E-08	1.000	conc
572	o479	7.184670E-08	1.000	conc
573	o480	7.851040E-08	1.000	conc
574	o481	8.479280E-08	1.000	conc
575	o482	9.020340E-08	1.000	conc
576	o483	9.425170E-08	1.000	conc
577	o484	9.644720E-08	1.000	conc
578	o485	9.629920E-08	1.000	conc
579	o486	9.331730E-08	1.000	conc
580	o487	8.703580E-08	1.000	conc
581	o488	7.771540E-08	1.000	conc
582	o489	6.644230E-08	1.000	conc
583	o490	5.434720E-08	1.000	conc
584	o491	4.256060E-08	1.000	conc



585	o492	3.221320E-08	1.000	conc
586	o493	2.443570E-08	1.000	conc
587	o494	2.032130E-08	1.000	conc
588	o495	2.013560E-08	1.000	conc
589	o496	2.333550E-08	1.000	conc
590	o497	2.934400E-08	1.000	conc
591	o498	3.758420E-08	1.000	conc
592	o499	4.747890E-08	1.000	conc
593	o500	5.845140E-08	1.000	conc

594  
595

596 Control settings:-

597  
598 Initial lambda : 10.000  
599 Lambda adjustment factor : 2.0000  
600 Sufficient new/old phi ratio per optimisation iteration : 0.30000  
601 Limiting relative phi reduction between lambdas : 1.00000E-02  
602 Maximum trial lambdas per iteration : 8  
603 Forgive model run failure during lamda testing : yes  
604 Forgive model run failure during Jacobian runs : yes  
605  
606 Perform Broyden's update of Jacobian matrix : no  
607 Undertake observation re-referencing : no  
608  
609 Maximum factor parameter change (factor-limited changes) : 10.000  
610 Maximum relative parameter change (relative-limited changes) : na  
611 Fraction of initial parameter values used in computing  
612 change limit for near-zero parameters : 1.00000E-03  
613 Allow bending of parameter upgrade vector : no  
614 Allow parameters to stick to their bounds : no  
615  
616 Relative phi reduction below which to begin use of  
617 central derivatives : 0.10000  
618 Iteration at which to first consider derivatives switch : 1  
619  
620 Relative phi reduction indicating convergence : 0.50000E-02  
621 Number of phi values required within this range : 4  
622 Maximum number of consecutive failures to lower phi : 4  
623 Minimal relative parameter change indicating convergence : 0.50000E-02  
624 Number of consecutive iterations with minimal param change : 4  
625 Maximum number of optimisation iterations : 200  
626  
627 Attempt automatic user intervention : no  
628  
629 Attempt reuse of parameter sensitivities : no  
630  
631 Scale parameters by their bounds : yes  
632

633  
634 File saving options: -  
635

636 Save best JCO file : yes  
637 Save multiple JCO files : no  
638 Save multiple REI files : no  
639 Save multiple PAR files : yes  
640

641  
642 OPTIMISATION RECORD  
643

644  
645 INITIAL CONDITIONS:  
646 Sum of squared weighted residuals (ie phi) = 3.40630E-09  
647

648 Current parameter values  
649 h1 40.0000  
650 s1 250.000  
651 p1 0.900000  
652 o1 1.000000E-05  
653

654  
655 OPTIMISATION ITERATION NO. : 1  
656 Model calls so far : 1  
657 Derivative model calls so far : 0

```

658 Starting phi for this iteration: 3.40630E-09
659
660 Lambda = 10.000 ----->
661 Phi = 3.25120E-09 ( 0.954 of starting phi)
662
663 Lambda = 5.0000 ----->
664 Phi = 3.25120E-09 ( 0.954 of starting phi)
665
666 No more lambdas: relative phi reduction between lambdas less than 0.0100
667 Lowest phi this iteration: 3.25120E-09
668 Relative phi reduction between optimisation iterations less than 0.1000
669 Switch to higher order derivatives calculation
670
671 Current parameter values Previous parameter values
672 h1 39.7726 h1 40.0000
673 s1 243.318 s1 250.000
674 p1 0.899875 p1 0.900000
675 o1 1.004959E-05 o1 1.000000E-05
676 Maximum factor change: 1.027 ["s1"]
677 Maximum relative change: 2.6727E-02 ["s1"]
678
679
680 OPTIMISATION ITERATION NO. : 2
681 Model calls so far : 5
682 Derivative model calls so far : 1
683 Starting phi for this iteration: 3.25120E-09
684
685 Lambda = 5.0000 ----->
686 Phi = 2.94127E-09 ( 0.905 of starting phi)
687
688 Lambda = 2.5000 ----->
689 Phi = 2.94127E-09 ( 0.905 of starting phi)
690
691 No more lambdas: relative phi reduction between lambdas less than 0.0100
692 Lowest phi this iteration: 2.94127E-09
693
694 Current parameter values Previous parameter values
695 h1 39.4163 h1 39.7726
696 s1 222.592 s1 243.318
697 p1 0.899693 p1 0.899875
698 o1 1.018809E-05 o1 1.004959E-05
699 Maximum factor change: 1.093 ["s1"]
700 Maximum relative change: 8.5183E-02 ["s1"]
701
702
703 OPTIMISATION ITERATION NO. : 3
704 Model calls so far : 11
705 Derivative model calls so far : 2
706 Starting phi for this iteration: 2.94127E-09
707
708 Lambda = 2.5000 ----->
709 Phi = 2.79694E-09 ( 0.951 of starting phi)
710
711 Lambda = 1.2500 ----->
712 Phi = 2.79694E-09 ( 0.951 of starting phi)
713
714 No more lambdas: relative phi reduction between lambdas less than 0.0100
715 Lowest phi this iteration: 2.79694E-09
716
717 Current parameter values Previous parameter values
718 h1 39.1908 h1 39.4163
719 s1 205.050 s1 222.592
720 p1 0.899564 p1 0.899693
721 o1 1.033842E-05 o1 1.018809E-05
722 Maximum factor change: 1.086 ["s1"]
723 Maximum relative change: 7.8805E-02 ["s1"]
724
725
726 OPTIMISATION ITERATION NO. : 4
727 Model calls so far : 17
728 Derivative model calls so far : 3
729 Starting phi for this iteration: 2.79694E-09
730

```

```

731      Lambda = 0.62500      ----->
732      Phi = 2.70642E-09 ( 0.968 of starting phi)
733
734      Lambda = 0.31250      ----->
735      Phi = 2.70642E-09 ( 0.968 of starting phi)
736
737      Lambda = 1.2500      ----->
738      Phi = 2.70642E-09 ( 0.968 of starting phi)
739
740      No more lambdas: phi rising
741      Lowest phi this iteration: 2.70642E-09
742
743      Current parameter values      Previous parameter values
744      h1      39.0354      h1      39.1908
745      s1      189.361      s1      205.050
746      p1      0.899465      p1      0.899564
747      o1      1.050122E-05      o1      1.033842E-05
748      Maximum factor change: 1.083      ["s1"]
749      Maximum relative change: 7.6514E-02      ["s1"]
750
751
752      OPTIMISATION ITERATION NO.      : 5
753      Model calls so far      : 24
754      Derivative model calls so far      : 4
755      Starting phi for this iteration: 2.70642E-09
756
757      Lambda = 0.62500      ----->
758      Phi = 2.64770E-09 ( 0.978 of starting phi)
759
760      Lambda = 0.31250      ----->
761      Phi = 2.64770E-09 ( 0.978 of starting phi)
762
763      No more lambdas: relative phi reduction between lambdas less than 0.0100
764      Lowest phi this iteration: 2.64770E-09
765
766      Current parameter values      Previous parameter values
767      h1      38.9299      h1      39.0354
768      s1      176.071      s1      189.361
769      p1      0.899390      p1      0.899465
770      o1      1.066639E-05      o1      1.050122E-05
771      Maximum factor change: 1.075      ["s1"]
772      Maximum relative change: 7.0184E-02      ["s1"]
773
774
775      OPTIMISATION ITERATION NO.      : 6
776      Model calls so far      : 30
777      Derivative model calls so far      : 5
778      Starting phi for this iteration: 2.64770E-09
779
780      Lambda = 0.15625      ----->
781      Phi = 2.61368E-09 ( 0.987 of starting phi)
782
783      Lambda = 7.81250E-02 ----->
784      Phi = 2.61368E-09 ( 0.987 of starting phi)
785
786      Lambda = 0.31250      ----->
787      Phi = 2.61368E-09 ( 0.987 of starting phi)
788
789      No more lambdas: phi rising
790      Lowest phi this iteration: 2.61368E-09
791
792      Current parameter values      Previous parameter values
793      h1      38.8622      h1      38.9299
794      s1      165.857      s1      176.071
795      p1      0.899335      p1      0.899390
796      o1      1.082255E-05      o1      1.066639E-05
797      Maximum factor change: 1.062      ["s1"]
798      Maximum relative change: 5.8011E-02      ["s1"]
799
800
801      OPTIMISATION ITERATION NO.      : 7
802      Model calls so far      : 37
803      Derivative model calls so far      : 6

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```

804 Starting phi for this iteration: 2.61368E-09
805
806 Lambda = 0.15625 ----->
807 Phi = 2.59279E-09 ( 0.992 of starting phi)
808
809 Lambda = 7.81250E-02 ----->
810 Phi = 2.59279E-09 ( 0.992 of starting phi)
811
812 No more lambdas: relative phi reduction between lambdas less than 0.0100
813 Lowest phi this iteration: 2.59279E-09
814
815 Current parameter values Previous parameter values
816 h1 38.8174 h1 38.8622
817 s1 157.901 s1 165.857
818 p1 0.899292 p1 0.899335
819 o1 1.098669E-05 o1 1.082255E-05
820 Maximum factor change: 1.050 ["s1"]
821 Maximum relative change: 4.7970E-02 ["s1"]
822
823
824 OPTIMISATION ITERATION NO. : 8
825 Model calls so far : 43
826 Derivative model calls so far : 7
827 Starting phi for this iteration: 2.59279E-09
828
829 Lambda = 3.90625E-02 ----->
830 Phi = 2.53940E-09 ( 0.979 of starting phi)
831
832 Lambda = 1.95313E-02 ----->
833 Phi = 2.53938E-09 ( 0.979 of starting phi)
834
835 No more lambdas: relative phi reduction between lambdas less than 0.0100
836 Lowest phi this iteration: 2.53938E-09
837
838 Current parameter values Previous parameter values
839 h1 38.7740 h1 38.8174
840 s1 145.344 s1 157.901
841 p1 0.899212 p1 0.899292
842 o1 1.157940E-05 o1 1.098669E-05
843 Maximum factor change: 1.086 ["s1"]
844 Maximum relative change: 7.9522E-02 ["s1"]
845
846
847 OPTIMISATION ITERATION NO. : 9
848 Model calls so far : 49
849 Derivative model calls so far : 8
850 Starting phi for this iteration: 2.53938E-09
851
852 Lambda = 9.76563E-03 ----->
853 Phi = 2.52278E-09 ( 0.993 of starting phi)
854
855 Lambda = 4.88281E-03 ----->
856 Phi = 2.52277E-09 ( 0.993 of starting phi)
857
858 No more lambdas: relative phi reduction between lambdas less than 0.0100
859 Lowest phi this iteration: 2.52277E-09
860
861 Current parameter values Previous parameter values
862 h1 38.8043 h1 38.7740
863 s1 150.296 s1 145.344
864 p1 0.899237 p1 0.899212
865 o1 1.156153E-05 o1 1.157940E-05
866 Maximum factor change: 1.034 ["s1"]
867 Maximum relative change: 3.4066E-02 ["s1"]
868
869
870 OPTIMISATION ITERATION NO. : 10
871 Model calls so far : 55
872 Derivative model calls so far : 9
873 Starting phi for this iteration: 2.52277E-09
874
875 Lambda = 2.44141E-03 ----->
876 Phi = 2.49515E-09 ( 0.989 of starting phi)

```

```

877
878     Lambda = 1.22070E-03 ----->
879     Phi = 2.49501E-09 ( 0.989 of starting phi)
880
881 No more lambdas: relative phi reduction between lambdas less than 0.0100
882 Lowest phi this iteration: 2.49501E-09
883
884     Current parameter values           Previous parameter values
885     h1              38.8655             h1              38.8043
886     s1              158.969             s1              150.296
887     p1              0.899274            p1              0.899237
888     o1              1.164314E-05        o1              1.156153E-05
889 Maximum factor change: 1.058 ["s1"]
890 Maximum relative change: 5.7707E-02 ["s1"]
891
892
893 OPTIMISATION ITERATION NO.           : 11
894 Model calls so far                   : 61
895 Derivative model calls so far       : 10
896 Starting phi for this iteration: 2.49501E-09
897
898     Lambda = 6.10352E-04 ----->
899     Phi = 2.47730E-09 ( 0.993 of starting phi)
900
901     Lambda = 3.05176E-04 ----->
902     Phi = 2.47707E-09 ( 0.993 of starting phi)
903
904 No more lambdas: relative phi reduction between lambdas less than 0.0100
905 Lowest phi this iteration: 2.47707E-09
906
907     Current parameter values           Previous parameter values
908     h1              38.8467             h1              38.8655
909     s1              154.572             s1              158.969
910     p1              0.899245            p1              0.899274
911     o1              1.181276E-05        o1              1.164314E-05
912 Maximum factor change: 1.028 ["s1"]
913 Maximum relative change: 2.7662E-02 ["s1"]
914
915
916 OPTIMISATION ITERATION NO.           : 12
917 Model calls so far                   : 67
918 Derivative model calls so far       : 11
919 Starting phi for this iteration: 2.47707E-09
920
921     Lambda = 1.52588E-04 ----->
922     Phi = 3.61906E-10 ( 0.146 of starting phi)
923
924 No more lambdas: phi is less than 0.3000 of starting phi
925 Lowest phi this iteration: 3.61906E-10
926
927     Current parameter values           Previous parameter values
928     h1              40.3253             h1              38.8467
929     s1              140.675             s1              154.572
930     p1              0.898122            p1              0.899245
931     o1              8.452134E-05        o1              1.181276E-05
932 Maximum factor change: 7.155 ["o1"]
933 Maximum relative change: 6.155 ["o1"]
934
935
936 OPTIMISATION ITERATION NO.           : 13
937 Model calls so far                   : 72
938 Derivative model calls so far       : 12
939 Starting phi for this iteration: 3.61906E-10
940
941     Lambda = 7.62939E-05 ----->
942     Phi = 3.38172E-10 ( 0.934 of starting phi)
943
944     Lambda = 3.81470E-05 ----->
945     Phi = 3.38165E-10 ( 0.934 of starting phi)
946
947 No more lambdas: relative phi reduction between lambdas less than 0.0100
948 Lowest phi this iteration: 3.38165E-10
949

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```

950      Current parameter values                Previous parameter values
951      h1                40.3008                h1                40.3253
952      s1                147.929                s1                140.675
953      p1                0.899294                p1                0.898122
954      o1                7.705132E-05                o1                8.452134E-05
955      Maximum factor change: 1.097 ["o1"]
956      Maximum relative change: 8.8380E-02 ["o1"]
957
958
959      OPTIMISATION ITERATION NO.                : 14
960      Model calls so far                : 78
961      Derivative model calls so far      : 13
962      Starting phi for this iteration: 3.38165E-10
963
964      Lambda = 1.90735E-05 ----->
965      Phi = 3.37717E-10 ( 0.999 of starting phi)
966
967      Lambda = 9.53674E-06 ----->
968      Phi = 3.37654E-10 ( 0.998 of starting phi)
969
970      No more lambdas: relative phi reduction between lambdas less than 0.0100
971      Lowest phi this iteration: 3.37654E-10
972
973      Current parameter values                Previous parameter values
974      h1                40.2981                h1                40.3008
975      s1                149.204                s1                147.929
976      p1                0.899070                p1                0.899294
977      o1                7.614777E-05                o1                7.705132E-05
978      Maximum factor change: 1.012 ["o1"]
979      Maximum relative change: 1.1727E-02 ["o1"]
980
981
982      OPTIMISATION ITERATION NO.                : 15
983      Model calls so far                : 84
984      Derivative model calls so far      : 14
985      Starting phi for this iteration: 3.37654E-10
986
987      Lambda = 4.76837E-06 ----->
988      Phi = 3.37204E-10 ( 0.999 of starting phi)
989
990      Lambda = 2.38419E-06 ----->
991      Phi = 3.37051E-10 ( 0.998 of starting phi)
992
993      No more lambdas: relative phi reduction between lambdas less than 0.0100
994      Lowest phi this iteration: 3.37051E-10
995
996      Current parameter values                Previous parameter values
997      h1                40.2984                h1                40.2981
998      s1                148.998                s1                149.204
999      p1                0.898303                p1                0.899070
1000     o1                7.659821E-05                o1                7.614777E-05
1001     Maximum factor change: 1.006 ["o1"]
1002     Maximum relative change: 5.9154E-03 ["o1"]
1003
1004
1005     OPTIMISATION ITERATION NO.                : 16
1006     Model calls so far                : 90
1007     Derivative model calls so far      : 15
1008     Starting phi for this iteration: 3.37051E-10
1009
1010     Lambda = 1.19209E-06 ----->
1011     Phi = 3.25891E-10 ( 0.967 of starting phi)
1012
1013     Lambda = 5.96046E-07 ----->
1014     Phi = 3.25698E-10 ( 0.966 of starting phi)
1015
1016     No more lambdas: relative phi reduction between lambdas less than 0.0100
1017     Lowest phi this iteration: 3.25698E-10
1018
1019     Current parameter values                Previous parameter values
1020     h1                40.2808                h1                40.2984
1021     s1                154.458                s1                148.998
1022     p1                0.872214                p1                0.898303

```

```

1023         o1                8.324239E-05                o1                7.659821E-05
1024 Maximum factor change: 1.087 ["o1"]
1025 Maximum relative change: 8.6741E-02 ["o1"]
1026
1027
1028 OPTIMISATION ITERATION NO.          : 17
1029 Model calls so far                  : 96
1030 Derivative model calls so far       : 16
1031 Starting phi for this iteration:    3.25698E-10
1032
1033         Lambda = 2.98023E-07 ----->
1034         Phi = 2.75008E-10 ( 0.844 of starting phi)
1035
1036         Lambda = 1.49012E-07 ----->
1037         Phi = 2.70922E-10 ( 0.832 of starting phi)
1038
1039         Lambda = 7.45058E-08 ----->
1040         Phi = 2.68367E-10 ( 0.824 of starting phi)
1041
1042 No more lambdas: relative phi reduction between lambdas less than 0.0100
1043 Lowest phi this iteration: 2.68367E-10
1044
1045         Current parameter values                Previous parameter values
1046         h1                39.9957                h1                40.2808
1047         s1                176.381                s1                154.458
1048         p1                0.844869                p1                0.872214
1049         o1                1.200756E-04                o1                8.324239E-05
1050 Maximum factor change: 1.442 ["o1"]
1051 Maximum relative change: 0.4425 ["o1"]
1052
1053
1054 OPTIMISATION ITERATION NO.          : 18
1055 Model calls so far                  : 103
1056 Derivative model calls so far       : 17
1057 Starting phi for this iteration:    2.68367E-10
1058
1059         Lambda = 3.72529E-08 ----->
1060         Phi = 2.57827E-10 ( 0.961 of starting phi)
1061
1062         Lambda = 1.86265E-08 ----->
1063         Phi = 2.53019E-10 ( 0.943 of starting phi)
1064
1065         Lambda = 9.31323E-09 ----->
1066         Phi = 2.42539E-10 ( 0.904 of starting phi)
1067
1068         Lambda = 4.65661E-09 ----->
1069         Phi = 2.20859E-10 ( 0.823 of starting phi)
1070
1071         Lambda = 2.32831E-09 ----->
1072         Phi = 1.97463E-10 ( 0.736 of starting phi)
1073
1074         Lambda = 1.16415E-09 ----->
1075         Phi = 2.07024E-10 ( 0.771 of starting phi)
1076
1077 No more lambdas: phi rising
1078 Lowest phi this iteration: 1.97463E-10
1079
1080         Current parameter values                Previous parameter values
1081         h1                39.7282                h1                39.9957
1082         s1                184.139                s1                176.381
1083         p1                0.902757                p1                0.844869
1084         o1                1.143853E-04                o1                1.200756E-04
1085 Maximum factor change: 1.069 ["p1"]
1086 Maximum relative change: 6.8517E-02 ["p1"]
1087
1088
1089 OPTIMISATION ITERATION NO.          : 19
1090 Model calls so far                  : 113
1091 Derivative model calls so far       : 18
1092 Starting phi for this iteration:    1.97463E-10
1093
1094         Lambda = 1.00000E-08 ----->
1095         Phi = 1.74044E-10 ( 0.881 of starting phi)

```

```

1096
1097     Lambda = 5.00000E-09 ----->
1098     Phi = 1.68618E-10 ( 0.854 of starting phi)
1099
1100     Lambda = 2.50000E-09 ----->
1101     Phi = 1.59917E-10 ( 0.810 of starting phi)
1102
1103     Lambda = 1.25000E-09 ----->
1104     Phi = 1.49475E-10 ( 0.757 of starting phi)
1105
1106     Lambda = 6.25000E-10 ----->
1107     Phi = 1.40664E-10 ( 0.712 of starting phi)
1108
1109     Lambda = 3.12500E-10 ----->
1110     Phi = 1.34087E-10 ( 0.679 of starting phi)
1111
1112     Lambda = 1.56250E-10 ----->
1113     Phi = 1.29749E-10 ( 0.657 of starting phi)
1114
1115     Lambda = 7.81250E-11 ----->
1116     Phi = 1.27359E-10 ( 0.645 of starting phi)
1117
1118 No more lambdas: allowed lambdas per iteration = 8
1119 Lowest phi this iteration: 1.27359E-10
1120
1121     Current parameter values          Previous parameter values
1122     h1              39.2239             h1              39.7282
1123     s1              216.009             s1              184.139
1124     p1              0.895856            p1              0.902757
1125     o1              2.039755E-04        o1              1.143853E-04
1126 Maximum factor change: 1.783          ["o1"]
1127 Maximum relative change: 0.7832       ["o1"]
1128
1129
1130 OPTIMISATION ITERATION NO.           : 20
1131 Model calls so far                   : 125
1132 Derivative model calls so far       : 19
1133 Starting phi for this iteration: 1.27359E-10
1134
1135     Lambda = 1.00000E-08 ----->
1136     Phi = 1.05456E-10 ( 0.828 of starting phi)
1137
1138     Lambda = 5.00000E-09 ----->
1139     Phi = 1.04864E-10 ( 0.823 of starting phi)
1140
1141 No more lambdas: relative phi reduction between lambdas less than 0.0100
1142 Lowest phi this iteration: 1.04864E-10
1143
1144     Current parameter values          Previous parameter values
1145     h1              39.1801             h1              39.2239
1146     s1              220.772             s1              216.009
1147     p1              0.892353            p1              0.895856
1148     o1              1.888348E-04        o1              2.039755E-04
1149 Maximum factor change: 1.080          ["o1"]
1150 Maximum relative change: 7.4228E-02 ["o1"]
1151
1152
1153 OPTIMISATION ITERATION NO.           : 21
1154 Model calls so far                   : 131
1155 Derivative model calls so far       : 20
1156 Starting phi for this iteration: 1.04864E-10
1157
1158     Lambda = 1.00000E-08 ----->
1159     Phi = 1.03656E-10 ( 0.988 of starting phi)
1160
1161     Lambda = 5.00000E-09 ----->
1162     Phi = 1.02553E-10 ( 0.978 of starting phi)
1163
1164     Lambda = 2.50000E-09 ----->
1165     Phi = 1.01033E-10 ( 0.963 of starting phi)
1166
1167     Lambda = 1.25000E-09 ----->
1168     Phi = 1.00472E-10 ( 0.958 of starting phi)

```



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1169
1170 No more lambdas: relative phi reduction between lambdas less than 0.0100
1171 Lowest phi this iteration: 1.00472E-10
1172
1173 Current parameter values Previous parameter values
1174 h1 39.1014 h1 39.1801
1175 s1 226.701 s1 220.772
1176 p1 0.889807 p1 0.892353
1177 o1 1.962592E-04 o1 1.888348E-04
1178 Maximum factor change: 1.039 ["o1"]
1179 Maximum relative change: 3.9317E-02 ["o1"]
1180
1181
1182 OPTIMISATION ITERATION NO. : 22
1183 Model calls so far : 139
1184 Derivative model calls so far : 21
1185 Starting phi for this iteration: 1.00472E-10
1186
1187 Lambda = 1.00000E-08 ----->
1188 Phi = 9.87595E-11 ( 0.983 of starting phi)
1189
1190 Lambda = 5.00000E-09 ----->
1191 Phi = 9.71659E-11 ( 0.967 of starting phi)
1192
1193 Lambda = 2.50000E-09 ----->
1194 Phi = 9.54897E-11 ( 0.950 of starting phi)
1195
1196 Lambda = 1.25000E-09 ----->
1197 Phi = 9.45401E-11 ( 0.941 of starting phi)
1198
1199 No more lambdas: relative phi reduction between lambdas less than 0.0100
1200 Lowest phi this iteration: 9.45401E-11
1201
1202 Current parameter values Previous parameter values
1203 h1 38.9139 h1 39.1014
1204 s1 241.801 s1 226.701
1205 p1 0.889801 p1 0.889807
1206 o1 2.213909E-04 o1 1.962592E-04
1207 Maximum factor change: 1.128 ["o1"]
1208 Maximum relative change: 0.1281 ["o1"]
1209
1210
1211 OPTIMISATION ITERATION NO. : 23
1212 Model calls so far : 147
1213 Derivative model calls so far : 22
1214 Starting phi for this iteration: 9.45401E-11
1215
1216 Lambda = 1.00000E-08 ----->
1217 Phi = 9.41861E-11 ( 0.996 of starting phi)
1218
1219 Lambda = 5.00000E-09 ----->
1220 Phi = 9.41302E-11 ( 0.996 of starting phi)
1221
1222 No more lambdas: relative phi reduction between lambdas less than 0.0100
1223 Lowest phi this iteration: 9.41302E-11
1224
1225 Current parameter values Previous parameter values
1226 h1 38.9023 h1 38.9139
1227 s1 242.067 s1 241.801
1228 p1 0.888611 p1 0.889801
1229 o1 2.205266E-04 o1 2.213909E-04
1230 Maximum factor change: 1.004 ["o1"]
1231 Maximum relative change: 3.9037E-03 ["o1"]
1232
1233
1234 OPTIMISATION ITERATION NO. : 24
1235 Model calls so far : 153
1236 Derivative model calls so far : 23
1237 Starting phi for this iteration: 9.41302E-11
1238
1239 Lambda = 1.00000E-08 ----->
1240 Phi = 9.40915E-11 ( 1.000 of starting phi)
1241

```

```

1242         Lambda = 5.00000E-09 ----->
1243         Phi = 9.40833E-11 ( 1.000 of starting phi)
1244
1245 No more lambdas: relative phi reduction between lambdas less than 0.0100
1246 Lowest phi this iteration: 9.40833E-11
1247
1248         Current parameter values                Previous parameter values
1249         h1                38.9005                h1                38.9023
1250         s1                242.330                s1                242.067
1251         p1                0.888559                p1                0.888611
1252         o1                2.209583E-04                o1                2.205266E-04
1253 Maximum factor change: 1.002 ["o1"]
1254 Maximum relative change: 1.9576E-03 ["o1"]
1255
1256
1257 OPTIMISATION ITERATION NO. : 25
1258 Model calls so far : 159
1259 Derivative model calls so far : 24
1260 Starting phi for this iteration: 9.40833E-11
1261
1262         Lambda = 1.00000E-08 ----->
1263         Phi = 9.37546E-11 ( 0.997 of starting phi)
1264
1265         Lambda = 5.00000E-09 ----->
1266         Phi = 9.34593E-11 ( 0.993 of starting phi)
1267
1268 No more lambdas: relative phi reduction between lambdas less than 0.0100
1269 Lowest phi this iteration: 9.34593E-11
1270
1271         Current parameter values                Previous parameter values
1272         h1                38.8504                h1                38.9005
1273         s1                247.573                s1                242.330
1274         p1                0.887755                p1                0.888559
1275         o1                2.295780E-04                o1                2.209583E-04
1276 Maximum factor change: 1.039 ["o1"]
1277 Maximum relative change: 3.9010E-02 ["o1"]
1278
1279
1280 OPTIMISATION ITERATION NO. : 26
1281 Model calls so far : 165
1282 Derivative model calls so far : 25
1283 Starting phi for this iteration: 9.34593E-11
1284
1285         Lambda = 1.00000E-08 ----->
1286         Phi = 9.33097E-11 ( 0.998 of starting phi)
1287
1288         Lambda = 5.00000E-09 ----->
1289         Phi = 9.32984E-11 ( 0.998 of starting phi)
1290
1291 No more lambdas: relative phi reduction between lambdas less than 0.0100
1292 Lowest phi this iteration: 9.32984E-11
1293
1294         Current parameter values                Previous parameter values
1295         h1                38.8403                h1                38.8504
1296         s1                247.212                s1                247.573
1297         p1                0.888011                p1                0.887755
1298         o1                2.287691E-04                o1                2.295780E-04
1299 Maximum factor change: 1.004 ["o1"]
1300 Maximum relative change: 3.5232E-03 ["o1"]
1301
1302
1303 OPTIMISATION ITERATION NO. : 27
1304 Model calls so far : 171
1305 Derivative model calls so far : 26
1306 Starting phi for this iteration: 9.32984E-11
1307
1308         Lambda = 1.00000E-08 ----->
1309         Phi = 9.32700E-11 ( 1.000 of starting phi)
1310
1311         Lambda = 5.00000E-09 ----->
1312         Phi = 9.32698E-11 ( 1.000 of starting phi)
1313
1314 No more lambdas: relative phi reduction between lambdas less than 0.0100

```

```

1315 Lowest phi this iteration: 9.32698E-11
1316
1317 Current parameter values Previous parameter values
1318 h1 38.8376 h1 38.8403
1319 s1 247.549 s1 247.212
1320 p1 0.887958 p1 0.888011
1321 o1 2.291732E-04 o1 2.287691E-04
1322 Maximum factor change: 1.002 ["o1"]
1323 Maximum relative change: 1.7663E-03 ["o1"]
1324
1325

```

```

1326 OPTIMISATION ITERATION NO. : 28
1327 Model calls so far : 177
1328 Derivative model calls so far : 27
1329 Starting phi for this iteration: 9.32698E-11
1330

```

```

1331 Lambda = 1.00000E-08 ----->
1332 Phi = 9.30904E-11 ( 0.998 of starting phi)
1333

```

```

1334 Lambda = 5.00000E-09 ----->
1335 Phi = 9.30452E-11 ( 0.998 of starting phi)
1336

```

```

1337 No more lambdas: relative phi reduction between lambdas less than 0.0100
1338 Lowest phi this iteration: 9.30452E-11
1339

```

```

1340 Current parameter values Previous parameter values
1341 h1 38.7989 h1 38.8376
1342 s1 250.144 s1 247.549
1343 p1 0.887726 p1 0.887958
1344 o1 2.339331E-04 o1 2.291732E-04
1345 Maximum factor change: 1.021 ["o1"]
1346 Maximum relative change: 2.0770E-02 ["o1"]
1347

```

```

1348 Optimisation complete: the 4 lowest phi's are within a relative distance
1349 of eachother of 5.000E-03
1350 Total model calls: 183
1351

```

```

1352 The model has been run one final time using best parameters.
1353 Thus all model input files contain best parameter values, and model
1354 output files contain model results based on these parameters.
1355

```

# 1356 OPTIMISATION RESULTS

```

1359 Covariance matrix and parameter confidence intervals cannot be determined:-
1360 Memory conservation is operative so that covariance matrix is not calculated.
1361

```

```

1363 Parameters ----->
1364

```

```

1365 Parameter Estimated value
1366 h1 38.7989
1367 s1 250.144
1368 p1 0.887726
1369 o1 2.339331E-04
1370

```

```

1371 See file mfit.sen for parameter sensitivities.
1372

```

```

1374 Observations ----->
1375

```

Observation	Measured value	Calculated value	Residual	Weight	Group
o1 conc	2.590000E-08	0.00000	2.590000E-08	1.000	
o2 conc	6.041790E-08	0.00000	6.041790E-08	1.000	
o3 conc	7.045510E-08	0.00000	7.045510E-08	1.000	
o4 conc	6.061850E-08	0.00000	6.061850E-08	1.000	
o5 conc	4.035480E-08	0.00000	4.035480E-08	1.000	

1383	o6 conc	1.840630E-08	0.00000	1.840630E-08	1.000
1384	o7 conc	2.862080E-09	6.548592-269	2.862080E-09	1.000
1385	o8 conc	1.398620E-09	4.838414-224	1.398620E-09	1.000
1386	o9 conc	1.242340E-08	1.685134-190	1.242340E-08	1.000
1387	o10 conc	2.511130E-08	1.654966-164	2.511130E-08	1.000
1388	o11 conc	2.840230E-08	8.453034-144	2.840230E-08	1.000
1389	o12 conc	1.623870E-08	6.209271-127	1.623870E-08	1.000
1390	o13 conc	1.391590E-09	5.996795-113	1.391590E-09	1.000
1391	o14 conc	0.00000	3.522993-101	-3.522993-101	1.000
1392	o15 conc	8.042150E-09	3.759690E-91	8.042150E-09	1.000
1393	o16 conc	2.323690E-08	1.625667E-82	2.323690E-08	1.000
1394	o17 conc	3.486020E-08	5.197733E-75	3.486020E-08	1.000
1395	o18 conc	3.221440E-08	1.946555E-68	3.221440E-08	1.000
1396	o19 conc	2.012160E-08	1.221087E-62	2.012160E-08	1.000
1397	o20 conc	1.820490E-08	1.701727E-57	1.820490E-08	1.000
1398	o21 conc	2.995640E-08	6.603809E-53	2.995640E-08	1.000
1399	o22 conc	3.351660E-08	8.567701E-49	3.351660E-08	1.000
1400	o23 conc	1.735370E-08	4.315774E-45	1.735370E-08	1.000
1401	o24 conc	0.00000	9.550668E-42	-9.550668E-42	1.000
1402	o25 conc	0.00000	1.029196E-38	-1.029196E-38	1.000
1403	o26 conc	1.827050E-09	5.888479E-36	1.827050E-09	1.000
1404	o27 conc	0.00000	1.924506E-33	-1.924506E-33	1.000
1405	o28 conc	2.878970E-09	3.823907E-31	2.878970E-09	1.000
1406	o29 conc	2.847040E-08	4.872594E-29	2.847040E-08	1.000
1407	o30 conc	5.884060E-08	4.169364E-27	5.884060E-08	1.000
1408	o31 conc	5.537600E-08	2.493219E-25	5.537600E-08	1.000
1409	o32 conc	2.838700E-08	1.078747E-23	2.838700E-08	1.000
1410	o33 conc	3.754250E-08	3.481354E-22	3.754250E-08	1.000
1411	o34 conc	9.696690E-08	8.606872E-21	9.696690E-08	1.000
1412	o35 conc	1.449780E-07	1.668957E-19	1.449780E-07	1.000
1413	o36 conc	1.388220E-07	2.591861E-18	1.388220E-07	1.000
1414	o37 conc	1.008400E-07	3.283983E-17	1.008400E-07	1.000
1415	o38 conc	6.353650E-08	3.451421E-16	6.353650E-08	1.000
1416	o39 conc	5.595610E-08	3.053735E-15	5.595610E-08	1.000
1417	o40 conc	6.928060E-08	2.304996E-14	6.928058E-08	1.000
1418	o41 conc	7.249730E-08	1.502128E-13	7.249715E-08	1.000
1419	o42	5.923150E-08	8.543327E-13	5.923065E-08	1.000

1420	conc o43	4.597250E-08	4.282238E-12	4.596822E-08	1.000
1421	conc o44	4.046490E-08	1.908465E-11	4.044582E-08	1.000
1422	conc o45	4.299730E-08	7.623672E-11	4.292106E-08	1.000
1423	conc o46	4.403430E-08	2.749779E-10	4.375932E-08	1.000
1424	conc o47	4.280100E-08	9.015621E-10	4.189944E-08	1.000
1425	conc o48	5.510130E-08	2.703473E-09	5.239783E-08	1.000
1426	conc o49	7.098810E-08	7.456249E-09	6.353185E-08	1.000
1427	conc o50	6.257670E-08	1.901238E-08	4.356432E-08	1.000
1428	conc o51	3.340120E-08	4.503375E-08	-1.163255E-08	1.000
1429	conc o52	2.130400E-09	9.952524E-08	-9.739484E-08	1.000
1430	conc o53	1.315980E-08	2.060562E-07	-1.928964E-07	1.000
1431	conc o54	1.742090E-07	4.011705E-07	-2.269615E-07	1.000
1432	conc o55	6.601930E-07	7.370206E-07	-7.682758E-08	1.000
1433	conc o56	1.501590E-06	1.281881E-06	2.197095E-07	1.000
1434	conc o57	2.390120E-06	2.117128E-06	2.729919E-07	1.000
1435	conc o58	3.116340E-06	3.329709E-06	-2.133686E-07	1.000
1436	conc o59	4.010250E-06	5.000056E-06	-9.898055E-07	1.000
1437	conc o60	5.504160E-06	7.186757E-06	-1.682597E-06	1.000
1438	conc o61	7.889550E-06	9.910560E-06	-2.021010E-06	1.000
1439	conc o62	1.136910E-05	1.314113E-05	-1.772029E-06	1.000
1440	conc o63	1.576620E-05	1.678997E-05	-1.023769E-06	1.000
1441	conc o64	2.067220E-05	2.071196E-05	-3.976305E-08	1.000
1442	conc o65	2.567570E-05	2.471626E-05	9.594354E-07	1.000
1443	conc o66	3.036650E-05	2.858524E-05	1.781259E-06	1.000
1444	conc o67	3.434180E-05	3.209842E-05	2.243381E-06	1.000
1445	conc o68	3.721140E-05	3.505732E-05	2.154080E-06	1.000
1446	conc o69	3.871450E-05	3.730699E-05	1.407509E-06	1.000
1447	conc o70	3.889650E-05	3.875090E-05	1.456021E-07	1.000
1448	conc o71	3.799760E-05	3.935732E-05	-1.359722E-06	1.000
1449	conc o72	3.684470E-05	3.915710E-05	-2.312397E-06	1.000
1450	conc o73	3.620540E-05	3.823404E-05	-2.028644E-06	1.000
1451	conc o74	3.552260E-05	3.671048E-05	-1.187880E-06	1.000
1452	conc o75	3.381830E-05	3.473057E-05	-9.122716E-07	1.000
1453	conc o76	3.141060E-05	3.244415E-05	-1.033547E-06	1.000
1454	conc o77	2.941670E-05	2.999296E-05	-5.762602E-07	1.000
1455	conc o78	2.819400E-05	2.750064E-05	6.933642E-07	1.000

1456	o79 conc	2.731840E-05	2.506668E-05	2.251722E-06	1.000
1457	o80 conc	2.593800E-05	2.276428E-05	3.173717E-06	1.000
1458	o81 conc	2.274050E-05	2.064124E-05	2.099259E-06	1.000
1459	o82 conc	1.876040E-05	1.872298E-05	3.741547E-08	1.000
1460	o83 conc	1.644770E-05	1.701686E-05	-5.691555E-07	1.000
1461	o84 conc	1.546030E-05	1.551677E-05	-5.646812E-08	1.000
1462	o85 conc	1.447720E-05	1.420765E-05	2.695465E-07	1.000
1463	o86 conc	1.325630E-05	1.306930E-05	1.870023E-07	1.000
1464	o87 conc	1.213110E-05	1.207938E-05	5.171879E-08	1.000
1465	o88 conc	1.106710E-05	1.121569E-05	-1.485857E-07	1.000
1466	o89 conc	1.003450E-05	1.045754E-05	-4.230392E-07	1.000
1467	o90 conc	9.242660E-06	9.786630E-06	-5.439704E-07	1.000
1468	o91 conc	8.848360E-06	9.187344E-06	-3.389836E-07	1.000
1469	o92 conc	8.809330E-06	8.646759E-06	1.625709E-07	1.000
1470	o93 conc	8.093760E-06	8.154447E-06	-6.068678E-08	1.000
1471	o94 conc	7.046590E-06	7.702148E-06	-6.555582E-07	1.000
1472	o95 conc	7.096300E-06	7.283421E-06	-1.871211E-07	1.000
1473	o96 conc	6.642990E-06	6.893290E-06	-2.502997E-07	1.000
1474	o97 conc	6.279300E-06	6.527930E-06	-2.486300E-07	1.000
1475	o98 conc	6.008520E-06	6.184401E-06	-1.758808E-07	1.000
1476	o99 conc	5.694840E-06	5.860425E-06	-1.655847E-07	1.000
1477	o100 conc	5.320280E-06	5.554215E-06	-2.339350E-07	1.000
1478	o101 conc	4.943720E-06	5.264344E-06	-3.206235E-07	1.000
1479	o102 conc	4.579720E-06	4.989642E-06	-4.099220E-07	1.000
1480	o103 conc	4.272880E-06	4.729130E-06	-4.562495E-07	1.000
1481	o104 conc	4.106740E-06	4.481961E-06	-3.752213E-07	1.000
1482	o105 conc	3.955550E-06	4.247392E-06	-2.918418E-07	1.000
1483	o106 conc	3.762510E-06	4.024749E-06	-2.622394E-07	1.000
1484	o107 conc	3.487950E-06	3.813419E-06	-3.254692E-07	1.000
1485	o108 conc	3.157850E-06	3.612831E-06	-4.549806E-07	1.000
1486	o109 conc	3.073580E-06	3.422449E-06	-3.488694E-07	1.000
1487	o110 conc	3.123350E-06	3.241772E-06	-1.184221E-07	1.000
1488	o111 conc	2.972620E-06	3.070322E-06	-9.770209E-08	1.000
1489	o112 conc	2.396930E-06	2.907647E-06	-5.107169E-07	1.000
1490	o113 conc	2.161300E-06	2.753316E-06	-5.920160E-07	1.000
1491	o114 conc	2.331570E-06	2.606919E-06	-2.753495E-07	1.000
1492	o115	2.195760E-06	2.468067E-06	-2.723067E-07	1.000

1493	conc o116	2.013480E-06	2.336385E-06	-3.229053E-07	1.000
1494	conc o117	1.992600E-06	2.211520E-06	-2.189202E-07	1.000
1495	conc o118	2.067110E-06	2.093133E-06	-2.602300E-08	1.000
1496	conc o119	2.024050E-06	1.980901E-06	4.314887E-08	1.000
1497	conc o120	1.793380E-06	1.874517E-06	-8.113713E-08	1.000
1498	conc o121	1.735330E-06	1.773688E-06	-3.835802E-08	1.000
1499	conc o122	1.782960E-06	1.678135E-06	1.048253E-07	1.000
1500	conc o123	1.637310E-06	1.587591E-06	4.971872E-08	1.000
1501	conc o124	1.542970E-06	1.501805E-06	4.116536E-08	1.000
1502	conc o125	1.594510E-06	1.420534E-06	1.739763E-07	1.000
1503	conc o126	1.661020E-06	1.343549E-06	3.174710E-07	1.000
1504	conc o127	1.640720E-06	1.270632E-06	3.700878E-07	1.000
1505	conc o128	1.554100E-06	1.201576E-06	3.525245E-07	1.000
1506	conc o129	1.449310E-06	1.136181E-06	3.131287E-07	1.000
1507	conc o130	1.372540E-06	1.074261E-06	2.982786E-07	1.000
1508	conc o131	1.335330E-06	1.015637E-06	3.196928E-07	1.000
1509	conc o132	1.319800E-06	9.601386E-07	3.596614E-07	1.000
1510	conc o133	1.307100E-06	9.076039E-07	3.994961E-07	1.000
1511	conc o134	1.279690E-06	8.578797E-07	4.218103E-07	1.000
1512	conc o135	1.235570E-06	8.108199E-07	4.247501E-07	1.000
1513	conc o136	1.183070E-06	7.662859E-07	4.167841E-07	1.000
1514	conc o137	1.130690E-06	7.241458E-07	4.065442E-07	1.000
1515	conc o138	1.085970E-06	6.842746E-07	4.016954E-07	1.000
1516	conc o139	1.054120E-06	6.465534E-07	4.075666E-07	1.000
1517	conc o140	1.040060E-06	6.108693E-07	4.291907E-07	1.000
1518	conc o141	1.047440E-06	5.771152E-07	4.703248E-07	1.000
1519	conc o142	1.067610E-06	5.451895E-07	5.224205E-07	1.000
1520	conc o143	1.084930E-06	5.149954E-07	5.699346E-07	1.000
1521	conc o144	1.083670E-06	4.864416E-07	5.972284E-07	1.000
1522	conc o145	1.051100E-06	4.594410E-07	5.916590E-07	1.000
1523	conc o146	9.960480E-07	4.339112E-07	5.621368E-07	1.000
1524	conc o147	9.367260E-07	4.097739E-07	5.269521E-07	1.000
1525	conc o148	8.912290E-07	3.869550E-07	5.042740E-07	1.000
1526	conc o149	8.673420E-07	3.653841E-07	5.019579E-07	1.000
1527	conc o150	8.570490E-07	3.449944E-07	5.120546E-07	1.000
1528	conc o151	8.509940E-07	3.257228E-07	5.252712E-07	1.000

1529	o152 conc	8.410760E-07	3.075093E-07	5.335667E-07	1.000
1530	o153 conc	8.267230E-07	2.902969E-07	5.364261E-07	1.000
1531	o154 conc	8.101600E-07	2.740319E-07	5.361281E-07	1.000
1532	o155 conc	7.936160E-07	2.586632E-07	5.349528E-07	1.000
1533	o156 conc	7.787460E-07	2.441424E-07	5.346036E-07	1.000
1534	o157 conc	7.646170E-07	2.304237E-07	5.341933E-07	1.000
1535	o158 conc	7.495700E-07	2.174636E-07	5.321064E-07	1.000
1536	o159 conc	7.320050E-07	2.052210E-07	5.267840E-07	1.000
1537	o160 conc	7.117650E-07	1.936570E-07	5.181080E-07	1.000
1538	o161 conc	6.901710E-07	1.827347E-07	5.074363E-07	1.000
1539	o162 conc	6.686150E-07	1.724191E-07	4.961959E-07	1.000
1540	o163 conc	6.488390E-07	1.626772E-07	4.861618E-07	1.000
1541	o164 conc	6.339230E-07	1.534776E-07	4.804454E-07	1.000
1542	o165 conc	6.272630E-07	1.447907E-07	4.824723E-07	1.000
1543	o166 conc	6.322520E-07	1.365884E-07	4.956636E-07	1.000
1544	o167 conc	6.483740E-07	1.288442E-07	5.195298E-07	1.000
1545	o168 conc	6.640750E-07	1.215328E-07	5.425422E-07	1.000
1546	o169 conc	6.717990E-07	1.146307E-07	5.571683E-07	1.000
1547	o170 conc	6.722490E-07	1.081151E-07	5.641339E-07	1.000
1548	o171 conc	6.667270E-07	1.019649E-07	5.647621E-07	1.000
1549	o172 conc	6.565360E-07	9.615986E-08	5.603761E-07	1.000
1550	o173 conc	6.429800E-07	9.068094E-08	5.522991E-07	1.000
1551	o174 conc	6.273620E-07	8.551011E-08	5.418519E-07	1.000
1552	o175 conc	6.109860E-07	8.063031E-08	5.303557E-07	1.000
1553	o176 conc	5.948490E-07	7.602543E-08	5.188236E-07	1.000
1554	o177 conc	5.787370E-07	7.168022E-08	5.070568E-07	1.000
1555	o178 conc	5.621310E-07	6.758025E-08	4.945508E-07	1.000
1556	o179 conc	5.445970E-07	6.371188E-08	4.808851E-07	1.000
1557	o180 conc	5.274260E-07	6.006224E-08	4.673638E-07	1.000
1558	o181 conc	5.135020E-07	5.661913E-08	4.568829E-07	1.000
1559	o182 conc	5.057720E-07	5.337104E-08	4.524010E-07	1.000
1560	o183 conc	5.056420E-07	5.030707E-08	4.553349E-07	1.000
1561	o184 conc	5.093550E-07	4.741694E-08	4.619381E-07	1.000
1562	o185 conc	5.120720E-07	4.469093E-08	4.673811E-07	1.000
1563	o186 conc	5.089570E-07	4.211983E-08	4.668372E-07	1.000
1564	o187 conc	4.979250E-07	3.969497E-08	4.582300E-07	1.000
1565	o188	4.838970E-07	3.740814E-08	4.464889E-07	1.000



1566	conc o189	4.728920E-07	3.525159E-08	4.376404E-07	1.000
1567	conc o190	4.702190E-07	3.321799E-08	4.370010E-07	1.000
1568	conc o191	4.733380E-07	3.130043E-08	4.420376E-07	1.000
1569	conc o192	4.748510E-07	2.949237E-08	4.453586E-07	1.000
1570	conc o193	4.673070E-07	2.778763E-08	4.395194E-07	1.000
1571	conc o194	4.478510E-07	2.618039E-08	4.216706E-07	1.000
1572	conc o195	4.235710E-07	2.466514E-08	3.989059E-07	1.000
1573	conc o196	4.028560E-07	2.323668E-08	3.796193E-07	1.000
1574	conc o197	3.940200E-07	2.189010E-08	3.721299E-07	1.000
1575	conc o198	3.997040E-07	2.062076E-08	3.790832E-07	1.000
1576	conc o199	4.130600E-07	1.942428E-08	3.936357E-07	1.000
1577	conc o200	4.263430E-07	1.829653E-08	4.080465E-07	1.000
1578	conc o201	4.326460E-07	1.723361E-08	4.154124E-07	1.000
1579	conc o202	4.306550E-07	1.623184E-08	4.144232E-07	1.000
1580	conc o203	4.213290E-07	1.528773E-08	4.060413E-07	1.000
1581	conc o204	4.056960E-07	1.439801E-08	3.912980E-07	1.000
1582	conc o205	3.878020E-07	1.355957E-08	3.742424E-07	1.000
1583	conc o206	3.760210E-07	1.276950E-08	3.632515E-07	1.000
1584	conc o207	3.790600E-07	1.202504E-08	3.670350E-07	1.000
1585	conc o208	4.048110E-07	1.132357E-08	3.934874E-07	1.000
1586	conc o209	4.380700E-07	1.066265E-08	4.274074E-07	1.000
1587	conc o210	4.505410E-07	1.003995E-08	4.405010E-07	1.000
1588	conc o211	4.448250E-07	9.453293E-09	4.353717E-07	1.000
1589	conc o212	4.285460E-07	8.900607E-09	4.196454E-07	1.000
1590	conc o213	4.093090E-07	8.379949E-09	4.009291E-07	1.000
1591	conc o214	3.923830E-07	7.889479E-09	3.844935E-07	1.000
1592	conc o215	3.785030E-07	7.427467E-09	3.710755E-07	1.000
1593	conc o216	3.678840E-07	6.992277E-09	3.608917E-07	1.000
1594	conc o217	3.606130E-07	6.582368E-09	3.540306E-07	1.000
1595	conc o218	3.557500E-07	6.196285E-09	3.495537E-07	1.000
1596	conc o219	3.518660E-07	5.832658E-09	3.460333E-07	1.000
1597	conc o220	3.475430E-07	5.490191E-09	3.420528E-07	1.000
1598	conc o221	3.421740E-07	5.167667E-09	3.370063E-07	1.000
1599	conc o222	3.365050E-07	4.863935E-09	3.316411E-07	1.000
1600	conc o223	3.314100E-07	4.577909E-09	3.268321E-07	1.000
1601	conc o224	3.277660E-07	4.308568E-09	3.234574E-07	1.000

1602	o225 conc	3.266420E-07	4.054947E-09	3.225871E-07	1.000
1603	o226 conc	3.293540E-07	3.816137E-09	3.255379E-07	1.000
1604	o227 conc	3.372350E-07	3.591281E-09	3.336437E-07	1.000
1605	o228 conc	3.503730E-07	3.379570E-09	3.469934E-07	1.000
1606	o229 conc	3.627350E-07	3.180244E-09	3.595548E-07	1.000
1607	o230 conc	3.664120E-07	2.992584E-09	3.634194E-07	1.000
1608	o231 conc	3.538240E-07	2.815913E-09	3.510081E-07	1.000
1609	o232 conc	3.267250E-07	2.649593E-09	3.240754E-07	1.000
1610	o233 conc	2.972220E-07	2.493023E-09	2.947290E-07	1.000
1611	o234 conc	2.779620E-07	2.345637E-09	2.756164E-07	1.000
1612	o235 conc	2.807770E-07	2.206900E-09	2.785701E-07	1.000
1613	o236 conc	3.027670E-07	2.076308E-09	3.006907E-07	1.000
1614	o237 conc	3.282720E-07	1.953388E-09	3.263186E-07	1.000
1615	o238 conc	3.412080E-07	1.837693E-09	3.393703E-07	1.000
1616	o239 conc	3.313560E-07	1.728802E-09	3.296272E-07	1.000
1617	o240 conc	3.067770E-07	1.626317E-09	3.051507E-07	1.000
1618	o241 conc	2.790880E-07	1.529864E-09	2.775581E-07	1.000
1619	o242 conc	2.593120E-07	1.439092E-09	2.578729E-07	1.000
1620	o243 conc	2.500270E-07	1.353669E-09	2.486733E-07	1.000
1621	o244 conc	2.475120E-07	1.273281E-09	2.462387E-07	1.000
1622	o245 conc	2.478980E-07	1.197635E-09	2.467004E-07	1.000
1623	o246 conc	2.476030E-07	1.126452E-09	2.464765E-07	1.000
1624	o247 conc	2.459700E-07	1.059472E-09	2.449105E-07	1.000
1625	o248 conc	2.440310E-07	9.964474E-10	2.430346E-07	1.000
1626	o249 conc	2.428400E-07	9.371475E-10	2.419029E-07	1.000
1627	o250 conc	2.429470E-07	8.813534E-10	2.420656E-07	1.000
1628	o251 conc	2.438980E-07	8.288594E-10	2.430691E-07	1.000
1629	o252 conc	2.451130E-07	7.794717E-10	2.443335E-07	1.000
1630	o253 conc	2.460160E-07	7.330079E-10	2.452830E-07	1.000
1631	o254 conc	2.460300E-07	6.892960E-10	2.453407E-07	1.000
1632	o255 conc	2.445760E-07	6.481743E-10	2.439278E-07	1.000
1633	o256 conc	2.410770E-07	6.094904E-10	2.404675E-07	1.000
1634	o257 conc	2.349560E-07	5.731007E-10	2.343829E-07	1.000
1635	o258 conc	2.256350E-07	5.388702E-10	2.250961E-07	1.000
1636	o259 conc	2.127040E-07	5.066717E-10	2.121973E-07	1.000
1637	o260 conc	1.975550E-07	4.763852E-10	1.970786E-07	1.000
1638	o261	1.826670E-07	4.478982E-10	1.822191E-07	1.000

1639	conc o262	1.705390E-07	4.211043E-10	1.701179E-07	1.000
1640	conc o263	1.636690E-07	3.959037E-10	1.632731E-07	1.000
1641	conc o264	1.644490E-07	3.722022E-10	1.640768E-07	1.000
1642	conc o265	1.726930E-07	3.499113E-10	1.723431E-07	1.000
1643	conc o266	1.855120E-07	3.289475E-10	1.851831E-07	1.000
1644	conc o267	1.998920E-07	3.092323E-10	1.995828E-07	1.000
1645	conc o268	2.128170E-07	2.906919E-10	2.125263E-07	1.000
1646	conc o269	2.212710E-07	2.732568E-10	2.209977E-07	1.000
1647	conc o270	2.227080E-07	2.568613E-10	2.224511E-07	1.000
1648	conc o271	2.176220E-07	2.414440E-10	2.173806E-07	1.000
1649	conc o272	2.077180E-07	2.269469E-10	2.074911E-07	1.000
1650	conc o273	1.947020E-07	2.133154E-10	1.944887E-07	1.000
1651	conc o274	1.802810E-07	2.004980E-10	1.800805E-07	1.000
1652	conc o275	1.661270E-07	1.884466E-10	1.659386E-07	1.000
1653	conc o276	1.534240E-07	1.771155E-10	1.532469E-07	1.000
1654	conc o277	1.430190E-07	1.664621E-10	1.428525E-07	1.000
1655	conc o278	1.357500E-07	1.564460E-10	1.355936E-07	1.000
1656	conc o279	1.324550E-07	1.470293E-10	1.323080E-07	1.000
1657	conc o280	1.339740E-07	1.381763E-10	1.338358E-07	1.000
1658	conc o281	1.405780E-07	1.298536E-10	1.404481E-07	1.000
1659	conc o282	1.502300E-07	1.220296E-10	1.501080E-07	1.000
1660	conc o283	1.603050E-07	1.146744E-10	1.601903E-07	1.000
1661	conc o284	1.681780E-07	1.077603E-10	1.680702E-07	1.000
1662	conc o285	1.712250E-07	1.012609E-10	1.711237E-07	1.000
1663	conc o286	1.672560E-07	9.515150E-11	1.671608E-07	1.000
1664	conc o287	1.574450E-07	8.940879E-11	1.573556E-07	1.000
1665	conc o288	1.445270E-07	8.401091E-11	1.444430E-07	1.000
1666	conc o289	1.312480E-07	7.893727E-11	1.311691E-07	1.000
1667	conc o290	1.203520E-07	7.416849E-11	1.202778E-07	1.000
1668	conc o291	1.145800E-07	6.968637E-11	1.145103E-07	1.000
1669	conc o292	1.155330E-07	6.547376E-11	1.154675E-07	1.000
1670	conc o293	1.218370E-07	6.151455E-11	1.217755E-07	1.000
1671	conc o294	1.316430E-07	5.779358E-11	1.315852E-07	1.000
1672	conc o295	1.431010E-07	5.429659E-11	1.430467E-07	1.000
1673	conc o296	1.543620E-07	5.101017E-11	1.543110E-07	1.000
1674	conc o297	1.637930E-07	4.792171E-11	1.637451E-07	1.000

1675	o298 conc	1.708000E-07	4.501935E-11	1.707550E-07	1.000
1676	o299 conc	1.751040E-07	4.229193E-11	1.750617E-07	1.000
1677	o300 conc	1.764210E-07	3.972897E-11	1.763813E-07	1.000
1678	o301 conc	1.744710E-07	3.732059E-11	1.744337E-07	1.000
1679	o302 conc	1.689780E-07	3.505752E-11	1.689429E-07	1.000
1680	o303 conc	1.601270E-07	3.293105E-11	1.600941E-07	1.000
1681	o304 conc	1.488840E-07	3.093296E-11	1.488531E-07	1.000
1682	o305 conc	1.362920E-07	2.905555E-11	1.362629E-07	1.000
1683	o306 conc	1.233950E-07	2.729157E-11	1.233677E-07	1.000
1684	o307 conc	1.112360E-07	2.563419E-11	1.112104E-07	1.000
1685	o308 conc	1.008570E-07	2.407701E-11	1.008329E-07	1.000
1686	o309 conc	9.328990E-08	2.261399E-11	9.326729E-08	1.000
1687	o310 conc	8.893630E-08	2.123947E-11	8.891506E-08	1.000
1688	o311 conc	8.728010E-08	1.994813E-11	8.726015E-08	1.000
1689	o312 conc	8.773220E-08	1.873496E-11	8.771347E-08	1.000
1690	o313 conc	8.970370E-08	1.759524E-11	8.968610E-08	1.000
1691	o314 conc	9.260560E-08	1.652455E-11	9.258908E-08	1.000
1692	o315 conc	9.584880E-08	1.551873E-11	9.583328E-08	1.000
1693	o316 conc	9.884430E-08	1.457387E-11	9.882973E-08	1.000
1694	o317 conc	1.011340E-07	1.368629E-11	1.011203E-07	1.000
1695	o318 conc	1.028180E-07	1.285254E-11	1.028051E-07	1.000
1696	o319 conc	1.041430E-07	1.206936E-11	1.041309E-07	1.000
1697	o320 conc	1.053590E-07	1.133370E-11	1.053477E-07	1.000
1698	o321 conc	1.067130E-07	1.064269E-11	1.067024E-07	1.000
1699	o322 conc	1.084520E-07	9.993643E-12	1.084420E-07	1.000
1700	o323 conc	1.108260E-07	9.384009E-12	1.108166E-07	1.000
1701	o324 conc	1.140510E-07	8.811410E-12	1.140422E-07	1.000
1702	o325 conc	1.178980E-07	8.273607E-12	1.178897E-07	1.000
1703	o326 conc	1.217920E-07	7.768494E-12	1.217842E-07	1.000
1704	o327 conc	1.251530E-07	7.294094E-12	1.251457E-07	1.000
1705	o328 conc	1.273980E-07	6.848547E-12	1.273912E-07	1.000
1706	o329 conc	1.279450E-07	6.430105E-12	1.279386E-07	1.000
1707	o330 conc	1.262120E-07	6.037128E-12	1.262060E-07	1.000
1708	o331 conc	1.216930E-07	5.668072E-12	1.216873E-07	1.000
1709	o332 conc	1.147900E-07	5.321487E-12	1.147847E-07	1.000
1710	o333 conc	1.064960E-07	4.996011E-12	1.064910E-07	1.000
1711	o334	9.781810E-08	4.690364E-12	9.781341E-08	1.000

1712	conc o335	8.976220E-08	4.403343E-12	8.975780E-08	1.000
1713	conc o336	8.333400E-08	4.133818E-12	8.332987E-08	1.000
1714	conc o337	7.953930E-08	3.880727E-12	7.953542E-08	1.000
1715	conc o338	7.937580E-08	3.643071E-12	7.937216E-08	1.000
1716	conc o339	8.310890E-08	3.419914E-12	8.310548E-08	1.000
1717	conc o340	8.970640E-08	3.210375E-12	8.970319E-08	1.000
1718	conc o341	9.800290E-08	3.013625E-12	9.799989E-08	1.000
1719	conc o342	1.068330E-07	2.828888E-12	1.068302E-07	1.000
1720	conc o343	1.150320E-07	2.655433E-12	1.150293E-07	1.000
1721	conc o344	1.214330E-07	2.492574E-12	1.214305E-07	1.000
1722	conc o345	1.248720E-07	2.339666E-12	1.248697E-07	1.000
1723	conc o346	1.244490E-07	2.196104E-12	1.244468E-07	1.000
1724	conc o347	1.206740E-07	2.061319E-12	1.206719E-07	1.000
1725	conc o348	1.145190E-07	1.934775E-12	1.145171E-07	1.000
1726	conc o349	1.069590E-07	1.815972E-12	1.069572E-07	1.000
1727	conc o350	9.896780E-08	1.704438E-12	9.896610E-08	1.000
1728	conc o351	9.151880E-08	1.599729E-12	9.151720E-08	1.000
1729	conc o352	8.558610E-08	1.501430E-12	8.558460E-08	1.000
1730	conc o353	8.210600E-08	1.409149E-12	8.210459E-08	1.000
1731	conc o354	8.126640E-08	1.322520E-12	8.126508E-08	1.000
1732	conc o355	8.256360E-08	1.241198E-12	8.256236E-08	1.000
1733	conc o356	8.546820E-08	1.164859E-12	8.546704E-08	1.000
1734	conc o357	8.945030E-08	1.093199E-12	8.944921E-08	1.000
1735	conc o358	9.398060E-08	1.025931E-12	9.397957E-08	1.000
1736	conc o359	9.852930E-08	9.627889E-13	9.852834E-08	1.000
1737	conc o360	1.025670E-07	9.035193E-13	1.025661E-07	1.000
1738	conc o361	1.056860E-07	8.478858E-13	1.056852E-07	1.000
1739	conc o362	1.077830E-07	7.956662E-13	1.077822E-07	1.000
1740	conc o363	1.088070E-07	7.466519E-13	1.088063E-07	1.000
1741	conc o364	1.087020E-07	7.006466E-13	1.087013E-07	1.000
1742	conc o365	1.074160E-07	6.574665E-13	1.074153E-07	1.000
1743	conc o366	1.048950E-07	6.169387E-13	1.048944E-07	1.000
1744	conc o367	1.010860E-07	5.789007E-13	1.010854E-07	1.000
1745	conc o368	9.611800E-08	5.432009E-13	9.611746E-08	1.000
1746	conc o369	9.050930E-08	5.096941E-13	9.050879E-08	1.000
1747	conc o370	8.482960E-08	4.782480E-13	8.482912E-08	1.000

1748	o371 conc	7.964840E-08	4.487356E-13	7.964795E-08	1.000
1749	o372 conc	7.553540E-08	4.210385E-13	7.553498E-08	1.000
1750	o373 conc	7.306010E-08	3.950454E-13	7.305970E-08	1.000
1751	o374 conc	7.279220E-08	3.706518E-13	7.279183E-08	1.000
1752	o375 conc	7.514010E-08	3.477597E-13	7.513975E-08	1.000
1753	o376 conc	7.944540E-08	3.262769E-13	7.944507E-08	1.000
1754	o377 conc	8.461630E-08	3.061170E-13	8.461599E-08	1.000
1755	o378 conc	8.955980E-08	2.871987E-13	8.955951E-08	1.000
1756	o379 conc	9.318290E-08	2.694460E-13	9.318263E-08	1.000
1757	o380 conc	9.439240E-08	2.527871E-13	9.439215E-08	1.000
1758	o381 conc	9.209550E-08	2.371550E-13	9.209526E-08	1.000
1759	o382 conc	8.524380E-08	2.224866E-13	8.524358E-08	1.000
1760	o383 conc	7.405490E-08	2.087226E-13	7.405469E-08	1.000
1761	o384 conc	6.015780E-08	1.958075E-13	6.015760E-08	1.000
1762	o385 conc	4.525560E-08	1.836891E-13	4.525542E-08	1.000
1763	o386 conc	3.105130E-08	1.723184E-13	3.105113E-08	1.000
1764	o387 conc	1.924800E-08	1.616495E-13	1.924784E-08	1.000
1765	o388 conc	1.154880E-08	1.516391E-13	1.154865E-08	1.000
1766	o389 conc	9.269960E-09	1.422467E-13	9.269818E-09	1.000
1767	o390 conc	1.192830E-08	1.334343E-13	1.192817E-08	1.000
1768	o391 conc	1.851730E-08	1.251663E-13	1.851717E-08	1.000
1769	o392 conc	2.803040E-08	1.174090E-13	2.803028E-08	1.000
1770	o393 conc	3.946100E-08	1.101311E-13	3.946089E-08	1.000
1771	o394 conc	5.180260E-08	1.033030E-13	5.180250E-08	1.000
1772	o395 conc	6.404870E-08	9.689698E-14	6.404860E-08	1.000
1773	o396 conc	7.522440E-08	9.088706E-14	7.522431E-08	1.000
1774	o397 conc	8.488610E-08	8.524880E-14	8.488601E-08	1.000
1775	o398 conc	9.302900E-08	7.995931E-14	9.302892E-08	1.000
1776	o399 conc	9.966150E-08	7.499708E-14	9.966143E-08	1.000
1777	o400 conc	1.047920E-07	7.034191E-14	1.047919E-07	1.000
1778	o401 conc	1.084280E-07	6.597486E-14	1.084279E-07	1.000
1779	o402 conc	1.105790E-07	6.187817E-14	1.105789E-07	1.000
1780	o403 conc	1.112630E-07	5.803513E-14	1.112629E-07	1.000
1781	o404 conc	1.106210E-07	5.443010E-14	1.106209E-07	1.000
1782	o405 conc	1.088860E-07	5.104838E-14	1.088859E-07	1.000
1783	o406 conc	1.062910E-07	4.787617E-14	1.062910E-07	1.000
1784	o407	1.030690E-07	4.490054E-14	1.030690E-07	1.000

1785	conc o408	9.945440E-08	4.210933E-14	9.945436E-08	1.000
1786	conc o409	9.568040E-08	3.949116E-14	9.568036E-08	1.000
1787	conc o410	9.197960E-08	3.703533E-14	9.197956E-08	1.000
1788	conc o411	8.849010E-08	3.473180E-14	8.849007E-08	1.000
1789	conc o412	8.516850E-08	3.257115E-14	8.516847E-08	1.000
1790	conc o413	8.195060E-08	3.054455E-14	8.195057E-08	1.000
1791	conc o414	7.877250E-08	2.864371E-14	7.877247E-08	1.000
1792	conc o415	7.557000E-08	2.686083E-14	7.556997E-08	1.000
1793	conc o416	7.227910E-08	2.518863E-14	7.227907E-08	1.000
1794	conc o417	6.883580E-08	2.362026E-14	6.883578E-08	1.000
1795	conc o418	6.520510E-08	2.214928E-14	6.520508E-08	1.000
1796	conc o419	6.152120E-08	2.076966E-14	6.152118E-08	1.000
1797	conc o420	5.797910E-08	1.947575E-14	5.797908E-08	1.000
1798	conc o421	5.477390E-08	1.826223E-14	5.477388E-08	1.000
1799	conc o422	5.210060E-08	1.712413E-14	5.210058E-08	1.000
1800	conc o423	5.015430E-08	1.605677E-14	5.015428E-08	1.000
1801	conc o424	4.913010E-08	1.505576E-14	4.913008E-08	1.000
1802	conc o425	4.914850E-08	1.411700E-14	4.914849E-08	1.000
1803	conc o426	4.996780E-08	1.323662E-14	4.996779E-08	1.000
1804	conc o427	5.123580E-08	1.241101E-14	5.123579E-08	1.000
1805	conc o428	5.260070E-08	1.163675E-14	5.260069E-08	1.000
1806	conc o429	5.372650E-08	1.091068E-14	5.372649E-08	1.000
1807	conc o430	5.452150E-08	1.022979E-14	5.452149E-08	1.000
1808	conc o431	5.508430E-08	9.591290E-15	5.508429E-08	1.000
1809	conc o432	5.551840E-08	8.992539E-15	5.551839E-08	1.000
1810	conc o433	5.592730E-08	8.431072E-15	5.592729E-08	1.000
1811	conc o434	5.641470E-08	7.904574E-15	5.641469E-08	1.000
1812	conc o435	5.708410E-08	7.410873E-15	5.708409E-08	1.000
1813	conc o436	5.803860E-08	6.947930E-15	5.803859E-08	1.000
1814	conc o437	5.931950E-08	6.513835E-15	5.931949E-08	1.000
1815	conc o438	6.083730E-08	6.106794E-15	6.083729E-08	1.000
1816	conc o439	6.248570E-08	5.725127E-15	6.248569E-08	1.000
1817	conc o440	6.415840E-08	5.367255E-15	6.415839E-08	1.000
1818	conc o441	6.574900E-08	5.031698E-15	6.574899E-08	1.000
1819	conc o442	6.715150E-08	4.717070E-15	6.715150E-08	1.000
1820	conc o443	6.825940E-08	4.422067E-15	6.825940E-08	1.000

1821	o444 conc	6.897850E-08	4.145469E-15	6.897850E-08	1.000
1822	o445 conc	6.929210E-08	3.886131E-15	6.929210E-08	1.000
1823	o446 conc	6.921410E-08	3.642978E-15	6.921410E-08	1.000
1824	o447 conc	6.875870E-08	3.415003E-15	6.875870E-08	1.000
1825	o448 conc	6.793980E-08	3.201260E-15	6.793980E-08	1.000
1826	o449 conc	6.677160E-08	3.000864E-15	6.677160E-08	1.000
1827	o450 conc	6.526820E-08	2.812983E-15	6.526820E-08	1.000
1828	o451 conc	6.346600E-08	2.636837E-15	6.346600E-08	1.000
1829	o452 conc	6.152200E-08	2.471696E-15	6.152200E-08	1.000
1830	o453 conc	5.963400E-08	2.316873E-15	5.963400E-08	1.000
1831	o454 conc	5.799960E-08	2.171725E-15	5.799960E-08	1.000
1832	o455 conc	5.681660E-08	2.035650E-15	5.681660E-08	1.000
1833	o456 conc	5.628270E-08	1.908081E-15	5.628270E-08	1.000
1834	o457 conc	5.659560E-08	1.788488E-15	5.659560E-08	1.000
1835	o458 conc	5.793820E-08	1.676374E-15	5.793820E-08	1.000
1836	o459 conc	6.018830E-08	1.571272E-15	6.018830E-08	1.000
1837	o460 conc	6.293640E-08	1.472744E-15	6.293640E-08	1.000
1838	o461 conc	6.576190E-08	1.380381E-15	6.576190E-08	1.000
1839	o462 conc	6.824420E-08	1.293797E-15	6.824420E-08	1.000
1840	o463 conc	6.996260E-08	1.212632E-15	6.996260E-08	1.000
1841	o464 conc	7.049670E-08	1.136547E-15	7.049670E-08	1.000
1842	o465 conc	6.942630E-08	1.065226E-15	6.942630E-08	1.000
1843	o466 conc	6.658270E-08	9.983701E-16	6.658270E-08	1.000
1844	o467 conc	6.244930E-08	9.357010E-16	6.244930E-08	1.000
1845	o468 conc	5.761370E-08	8.769571E-16	5.761370E-08	1.000
1846	o469 conc	5.266350E-08	8.218930E-16	5.266350E-08	1.000
1847	o470 conc	4.818620E-08	7.702788E-16	4.818620E-08	1.000
1848	o471 conc	4.476960E-08	7.218989E-16	4.476960E-08	1.000
1849	o472 conc	4.300000E-08	6.765511E-16	4.300000E-08	1.000
1850	o473 conc	4.321500E-08	6.340457E-16	4.321500E-08	1.000
1851	o474 conc	4.520450E-08	5.942050E-16	4.520450E-08	1.000
1852	o475 conc	4.868480E-08	5.568624E-16	4.868480E-08	1.000
1853	o476 conc	5.337270E-08	5.218615E-16	5.337270E-08	1.000
1854	o477 conc	5.898460E-08	4.890558E-16	5.898460E-08	1.000
1855	o478 conc	6.523700E-08	4.583080E-16	6.523700E-08	1.000
1856	o479 conc	7.184670E-08	4.294893E-16	7.184670E-08	1.000
1857	o480	7.851040E-08	4.024789E-16	7.851040E-08	1.000



1858	conc o481	8.479280E-08	3.771635E-16	8.479280E-08	1.000
1859	conc o482	9.020340E-08	3.534372E-16	9.020340E-08	1.000
1860	conc o483	9.425170E-08	3.312003E-16	9.425170E-08	1.000
1861	conc o484	9.644720E-08	3.103595E-16	9.644720E-08	1.000
1862	conc o485	9.629920E-08	2.908274E-16	9.629920E-08	1.000
1863	conc o486	9.331730E-08	2.725220E-16	9.331730E-08	1.000
1864	conc o487	8.703580E-08	2.553664E-16	8.703580E-08	1.000
1865	conc o488	7.771540E-08	2.392885E-16	7.771540E-08	1.000
1866	conc o489	6.644230E-08	2.242208E-16	6.644230E-08	1.000
1867	conc o490	5.434720E-08	2.101000E-16	5.434720E-08	1.000
1868	conc o491	4.256060E-08	1.968667E-16	4.256060E-08	1.000
1869	conc o492	3.221320E-08	1.844652E-16	3.221320E-08	1.000
1870	conc o493	2.443570E-08	1.728433E-16	2.443570E-08	1.000
1871	conc o494	2.032130E-08	1.619522E-16	2.032130E-08	1.000
1872	conc o495	2.013560E-08	1.517459E-16	2.013560E-08	1.000
1873	conc o496	2.333550E-08	1.421816E-16	2.333550E-08	1.000
1874	conc o497	2.934400E-08	1.332189E-16	2.934400E-08	1.000
1875	conc o498	3.758420E-08	1.248201E-16	3.758420E-08	1.000
1876	conc o499	4.747890E-08	1.169497E-16	4.747890E-08	1.000
1877	conc o500	5.845140E-08	1.095746E-16	5.845140E-08	1.000

1878  
1879 See file mfit.res for more details of residuals in graph-ready format.  
1880

1881 See file mfit.seo for composite observation sensitivities.  
1882  
1883

1884 Objective function ----->  
1885

1886 Sum of squared weighted residuals (ie phi) = 9.3045E-11  
1887  
1888

1889 Correlation Coefficient ----->  
1890

1891 Correlation coefficient = 0.99790  
1892  
1893

1894 Analysis of residuals ----->  
1895

1896 All residuals:-  
1897 Number of residuals with non-zero weight = 500  
1898 Mean value of non-zero weighted residuals = 1.3930E-07  
1899 Maximum weighted residual [observation "o80"] = 3.1737E-06  
1900 Minimum weighted residual [observation "o72"] = -2.3124E-06  
1901 Standard variance of weighted residuals = 1.8759E-13  
1902 Standard error of weighted residuals = 4.3312E-07  
1903

1904 Note: the above variance was obtained by dividing the objective  
1905 function by the number of system degrees of freedom (ie. number of  
1906 observations with non-zero weight plus number of prior information  
1907 articles with non-zero weight minus the number of adjustable parameters.)  
1908 If the degrees of freedom is negative the divisor becomes  
1909 the number of observations with non-zero weight plus the number of

1910 prior information items with non-zero weight.  
1911  
1912  
1913 Covariance and other statistical matrices cannot be determined:-  
1914 Memory conservation is operative so that covariance matrix is not calculated.  
1915  
1916