

Supplementary Information

Numerical and Experimental Validation of Mixing Efficiency in Periodic Disturbance Mixers

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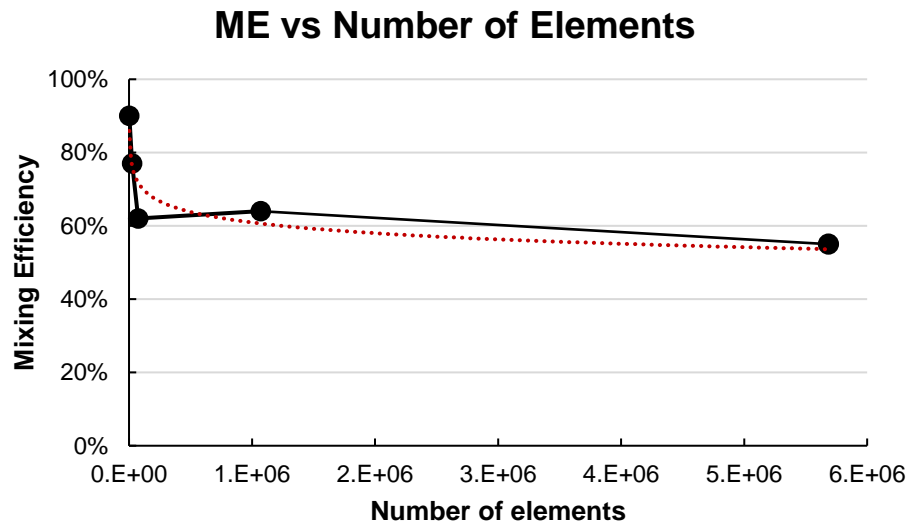


Figure S1. Mixing Efficiency vs Number of Mesh Elements for FRR=1, TFR=18 mL/h at AR=0.42 at 23 ms from the beginning of the channel. The red trendline shows an asymptotical behavior above 5 million of mesh elements.

Table S1. Results of calculating gray intensity, mixing efficiency using image processing and the numerical model (TFR = 18mL/h). These results correspond to the percentage of images used for the validation step, the first iteration of cross-validation.

Data	Time (ms)	0	23	32	41	51	60	79	Final
FRR = 1 TFR = 18 mL/h AR = 0.42	Gray intensity	169	98	101	131	139	151	154	161
	% ME - Image Processing	0%	58%	60%	78%	82%	89%	91%	95%
	% ME - Numerical Model	0%	55%	57%	77%	79%	89%	94%	97%
FRR = 3 TFR = 18 mL/h AR = 0.42	Gray intensity	169	102	115	146	146	147	158	162
	% ME - Image Processing	0%	61%	68%	86%	86%	88%	93%	95%
	% ME - Numerical Model	0%	65%	68%	85%	86%	93%	97%	98%
FRR = 9 TFR = 18 mL/h AR = 0.42	Gray intensity	169	133	153	148	158	161	166	161
	% ME - Image Processing	0%	78%	90%	87%	93%	95%	98%	95%
	% ME - Numerical Model	0%	81%	85%	93%	94%	97%	99%	99%
FRR = 5 TFR = 18 mL/h AR = 0.42	Gray intensity	167	118	122	144	152	157	159	163
	% ME - Image Processing	0%	71%	73%	86%	91%	94%	95%	98%
	% ME - Numerical Model	0%	68%	73%	87%	88%	94%	97%	99%
FRR = 7 TFR = 18 mL/h AR = 0.42	Gray intensity	165	119	130	141	154	157	159	161
	% ME - Image Processing	0%	72%	79%	85%	93%	95%	96%	98%
	% ME - Numerical Model	0%	76%	81%	91%	92%	96%	98%	99%
FRR = 12 TFR = 18 mL/h AR = 0.42	Gray intensity	165	120	132	147	154	157	159	163
	% ME - Image Processing	0%	73%	80%	89%	93%	95%	96%	99%
	% ME - Numerical Model	0%	77%	83%	92%	93%	97%	99%	99%
FRR = 1 TFR = 18 mL/h AR = 0.67	Gray intensity	164	53	59	77	89	102	122	139
	% ME - Image Processing	0%	32%	36%	47%	54%	62%	74%	85%
	% ME - Numerical Model	0%	29%	37%	47%	55%	63%	75%	83%
FRR = 3	Gray intensity	173	84	95	121	132	142	155	161

TFR = 18 mL/h AR= 0.67	% ME - Image Processing	0%	49%	55%	70%	76%	82%	90%	93%
	% ME - Numerical Model	0%	44%	55%	69%	73%	81%	88%	92%
	Gray intensity	162	82	101	127	132	141	150	159
FRR = 5 TFR = 18 mL/h AR= 0.67	% ME - Image Processing	0%	51%	62%	78%	81%	87%	93%	98%
	% ME - Numerical Model	0%	48%	61%	76%	79%	86%	91%	95%
	Gray intensity	166	105	123	140	147	152	158	162
FRR = 7 TFR = 18 mL/h AR= 0.67	% ME - Image Processing	0%	63%	74%	84%	89%	92%	95%	98%
	% ME - Numerical Model	0%	63%	73%	84%	86%	91%	95%	97%
	Gray intensity	168	122	138	142	152	154	159	165
FRR = 9 TFR = 18 mL/h AR= 0.67	% ME - Image Processing	0%	73%	82%	85%	90%	92%	95%	98%
	% ME - Numerical Model	0%	72%	79%	88%	90%	94%	96%	98%