

# SUPPLEMENTARY MATERIAL 1: DATA FILE OF THE SPR

## // Define the linkage and joint of the SPR

```
HINGE 1 1 2 0 1 0
BEAM 4 3 2 4 5 0 1 0
HINGE 2 5 6 0 1 0
BEAM 5 4 6 7 8 0 1 0
HINGE 3 8 9 1 0 1
BEAM 6 7 9 10 11 0 1 0
BEAM 7 10 11 12 13 0 1 0
HINGE 8 13 14 1 0 1
BEAM 9 12 14 15 16 0 1 0
HINGE 10 16 17 0 1 0
BEAM 11 15 17 18 19 0 1 0
HINGE 12 19 20 0 1 0
BEAM 13 10 11 21 22 0 1 0
HINGE 14 22 23 1 0 1
BEAM 15 21 23 24 25 0 1 0
HINGE 16 25 26 0 1 0
BEAM 17 24 26 27 28 0 1 0
HINGE 18 28 29 0 1 0
BEAM 19 3 2 30 31 0 1 0
HINGE 20 31 32 0 -1 0
BEAM 21 18 19 33 34 0 1 0
HINGE 22 34 35 0 -1 0
BEAM 23 27 28 36 37 0 1 0
HINGE 24 37 38 0 -1 0
```

## //Define the initial state of the SPR

```
X 3 0.000 0.1621 -0.0643
X 4 -0.0521 -0.1498 -0.0376
X 7 0.0087 -0.1095 0.0905
X 10 0.0 0.0 0.0905
X 12 0.0948 0.0548 0.0905
X 15 0.1298 0.0749 -0.0376
X 18 -0.1404 -0.0809 -0.0643
X 21 -0.0948 0.0548 0.0905
X 24 -0.1298 0.0749 -0.0376
X 27 0.1404 -0.0811 -0.0643
X 30 0.0002 0.1621 -0.0235
X 33 -0.1404 -0.0809 -0.0235
X 36 0.1404 -0.0811 -0.0235
```

## //Define the three DOF of the SPR

```
FIX 1
FIX 3
INPUTX 10 1
112
INPUTX 10 2
INPUTX 10 3
RLSE 1 1
RLSE 2 1
RLSE 3 1
```

END

HALT

## //Define the inertia of the SPR

```
XM 3 0.5294
XM 20 0.5294
XM 29 0.5294
EM 4 0.69
EM 5 3.93
EM 6 1.72
EM 7 1.72
EM 9 3.93
EM 11 0.69
EM 13 1.72
EM 15 3.93
EM 17 0.69
END
HALT
```