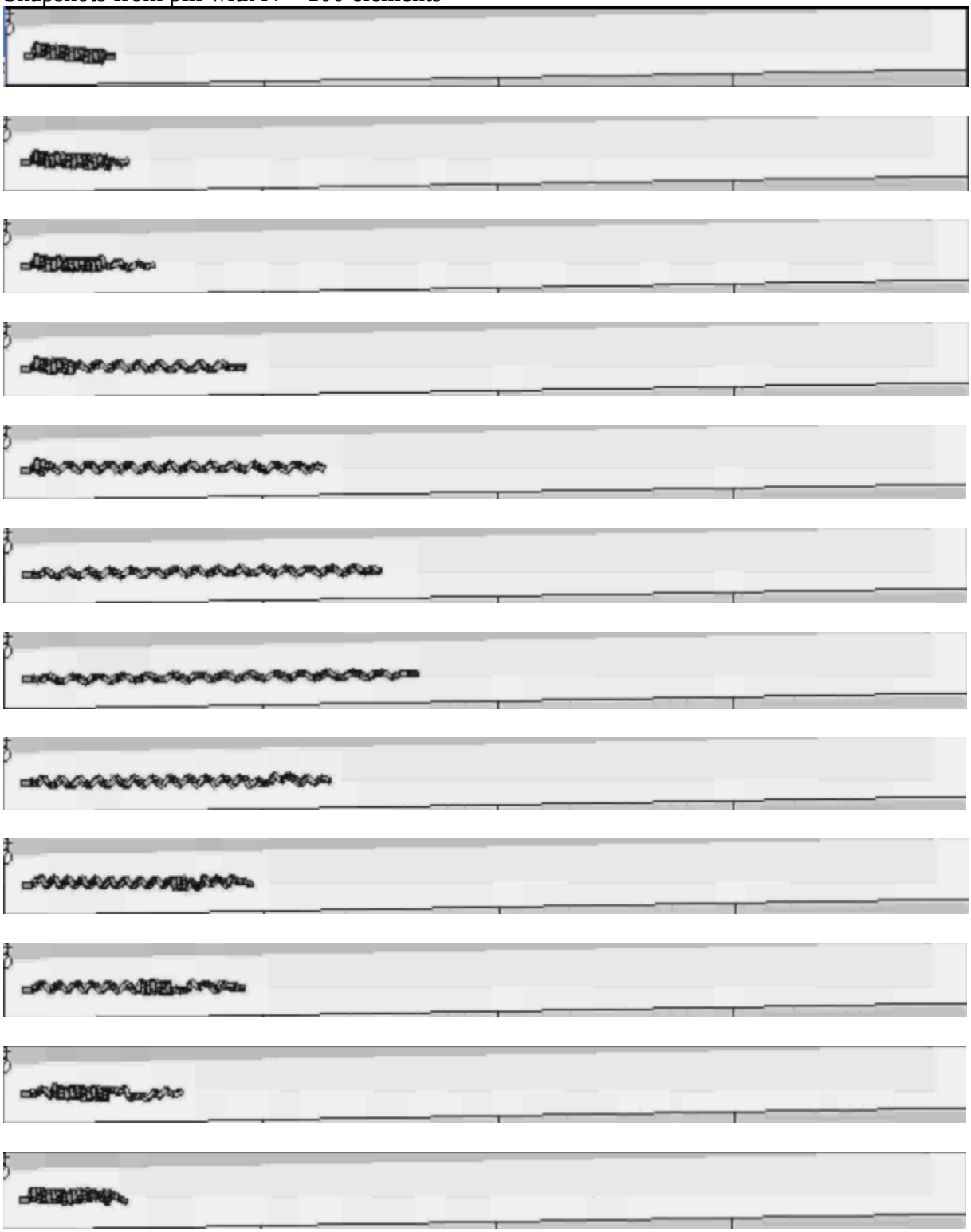
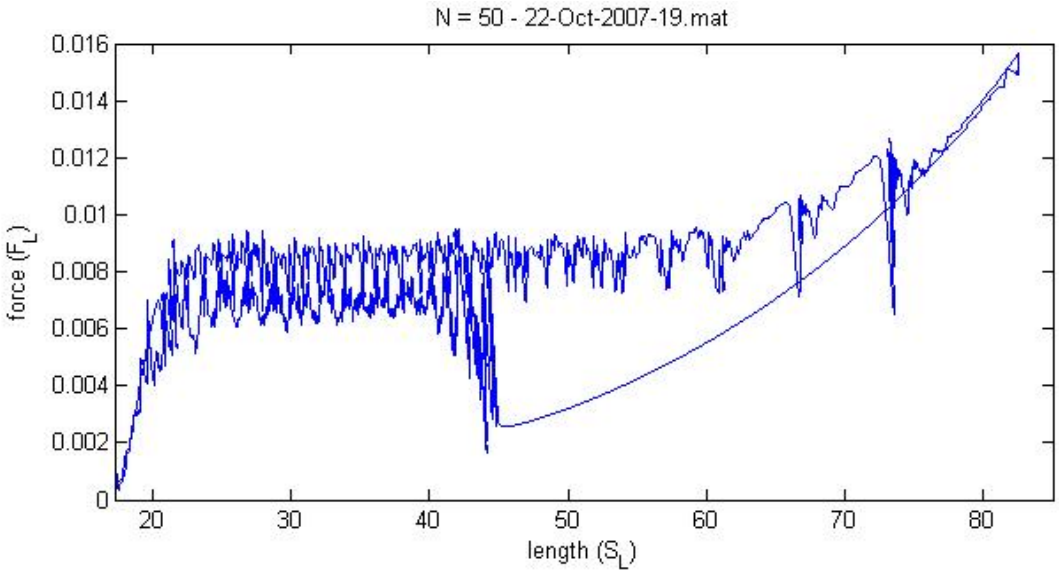
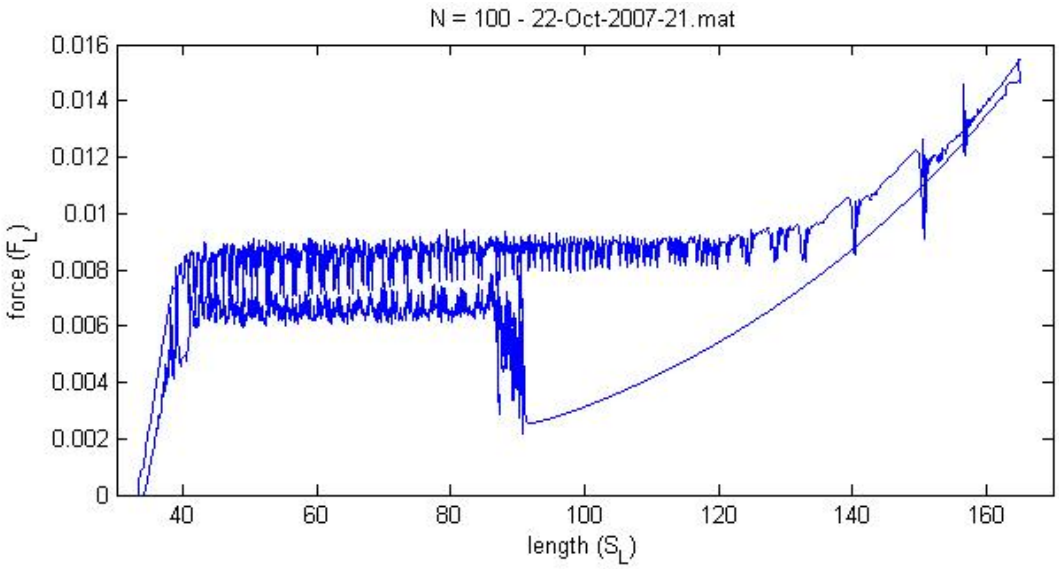
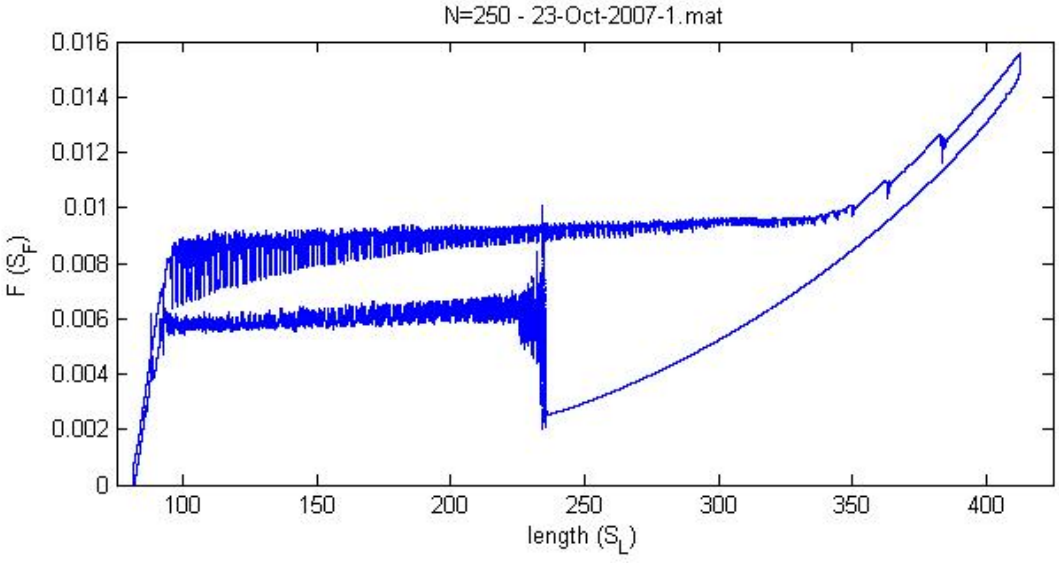
Pili simulation – 2007-10-23

Snapshots from pili with N = 100 elements




N = 50 - 22-Oct-2007-19.mat
force (F_L)
length (S_L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
20
30
40
50
60
70
80


N = 100 - 22-Oct-2007-21.mat
force (F_L)
length (S_L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
40
60
80
100
120
140
160


N=250 - 23-Oct-2007-1.mat
F (S_F)
length (S_L)
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
100
150
200
250
300
350
400

Simulation parameters

```
NP = …     % Number of blocks – set by function call
dt = 0.01; % Timestep
nsteps = 50; % Update graphics every nsteps timestep
mass = 0.0004; % Mass of blocks
k_v = 0.1*0.0005; % Velocity friction coefficient
k_w = 0.1*0.0001; % Rotation friction coefficient
U_0 = 0.005; % Potential depth
L = 2.5*0.3; % Potential characteristic length
reverse = false;
t_speed = 0.1; % Speed of trap

% Set epsilon
% EPS can be seen as an stiffness parameter
EPS0 = 0;             % element-to-element ball-link parameter
EPS1 = 250*0.5;       % bending parameter
EPS2 = 100*2.6;       % orthogonal to bending 1 parameter
EPS3 = 100*2.6;       % orthogonal to bending 2 parameter
EPST = 100;           % pili-to-bead link paramater
```

Guide to experimenting with the simulation

```
-- modify parameters --

mmolecules13(NP, L_T, make_movie, movie_name)         % run simulatio
% usage: mmolecules9(NP, L_T, make_movie, movie_name)
% int NP: Number of papA
% double L_T: Pull chain this length, measured in units of NP
% Boolean make_movie: True to record movie
% String movie_name: Save movie to this file, must be provided if
%       make_movie == true

load('22-Oct-2007-19.mat')      % Load simulation data

plot(x_save,F2)                 % Plot simulation output
```