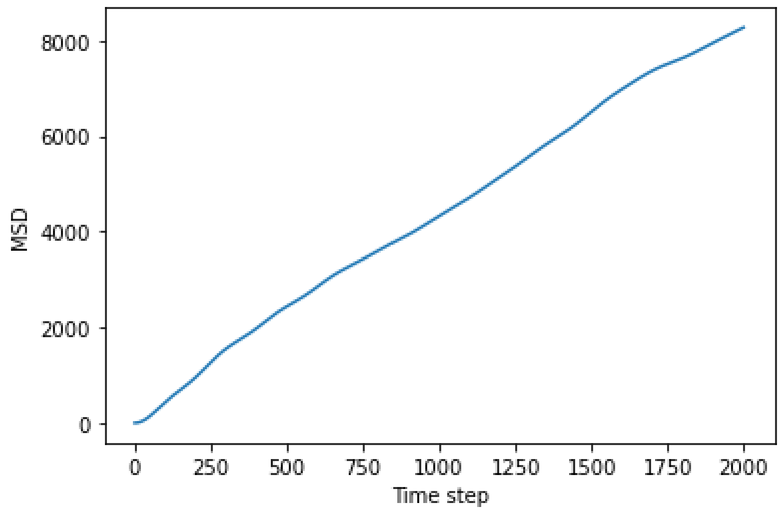
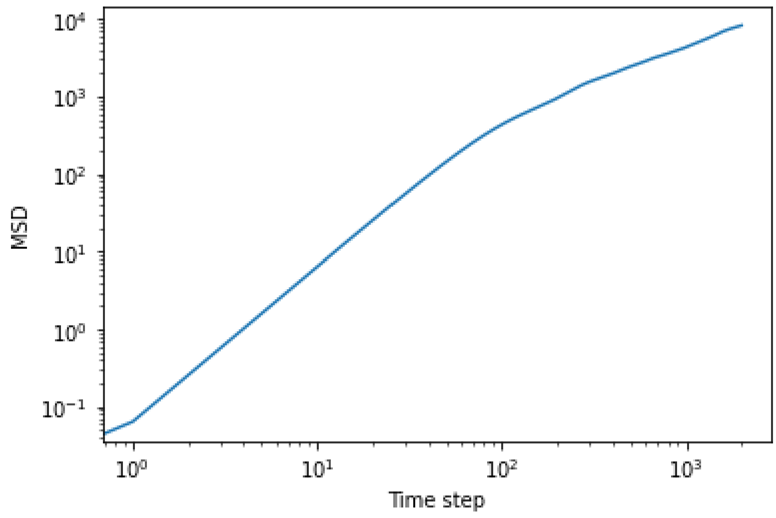
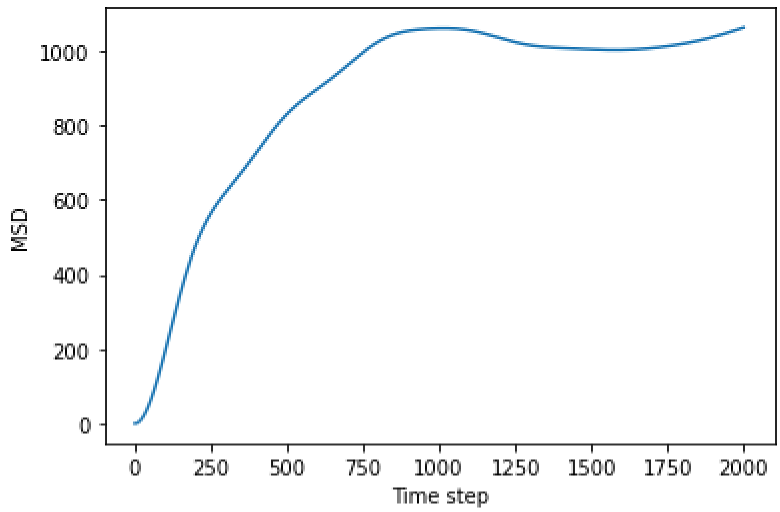
```
# Parameters
N = 100 # number of monomers
L = 10 # distance between monomers
k = 6 # spring constant
eps=0.5 # drag coefficient
dt=0.04 # time step
nsteps=2000 # number of steps
T= 300
m=124
```

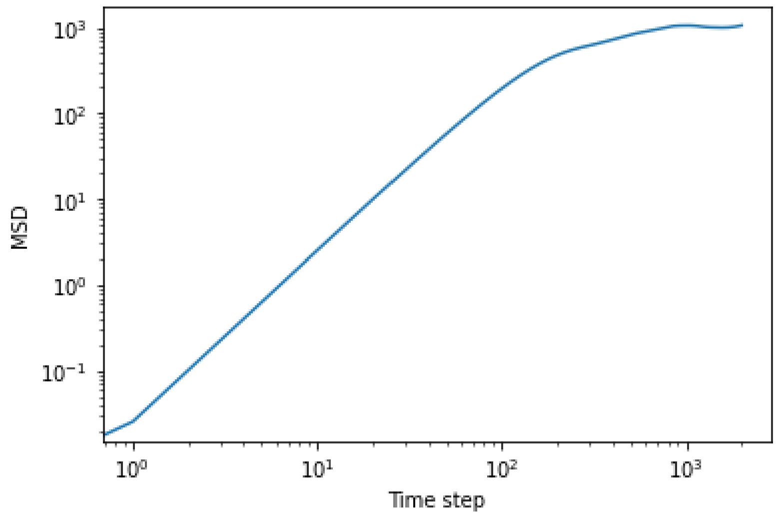




MSD plots for underdamped case

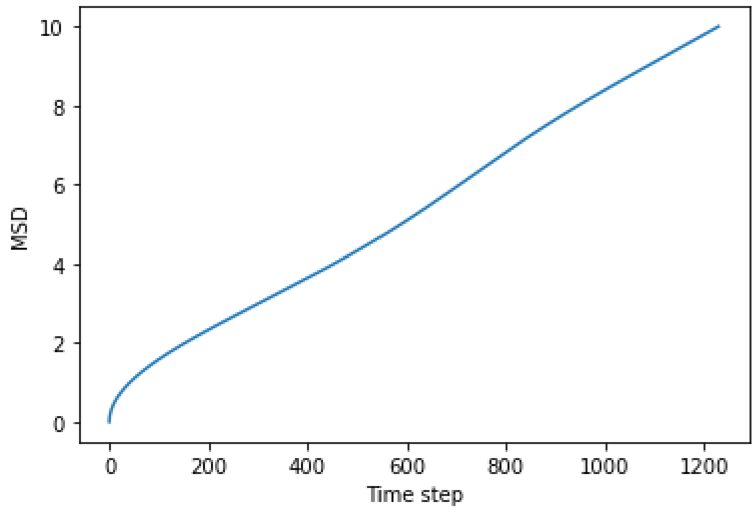
```
# Parameters
N = 100 # number of monomers
L = 10 # distance between monomers
k = 2 # spring constant
eps=5 # drag coefficient
dt=0.04 # time step
nsteps=2000 # number of steps
T= 300
m=124
```

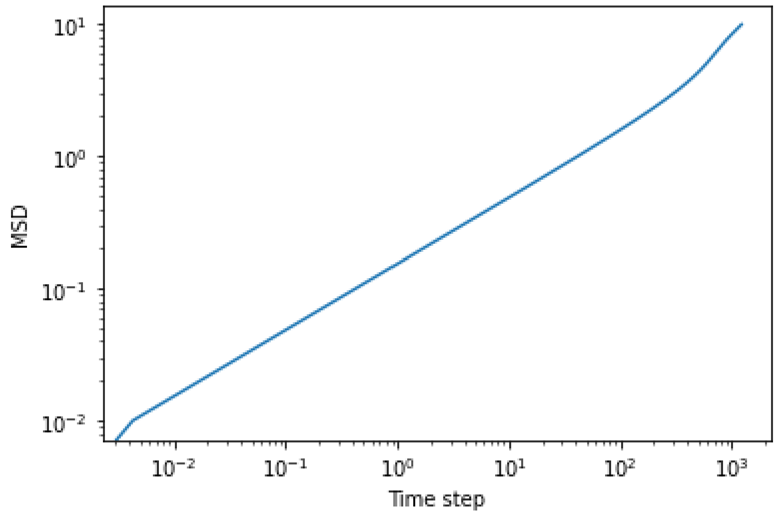




MSD plots for overdamped case

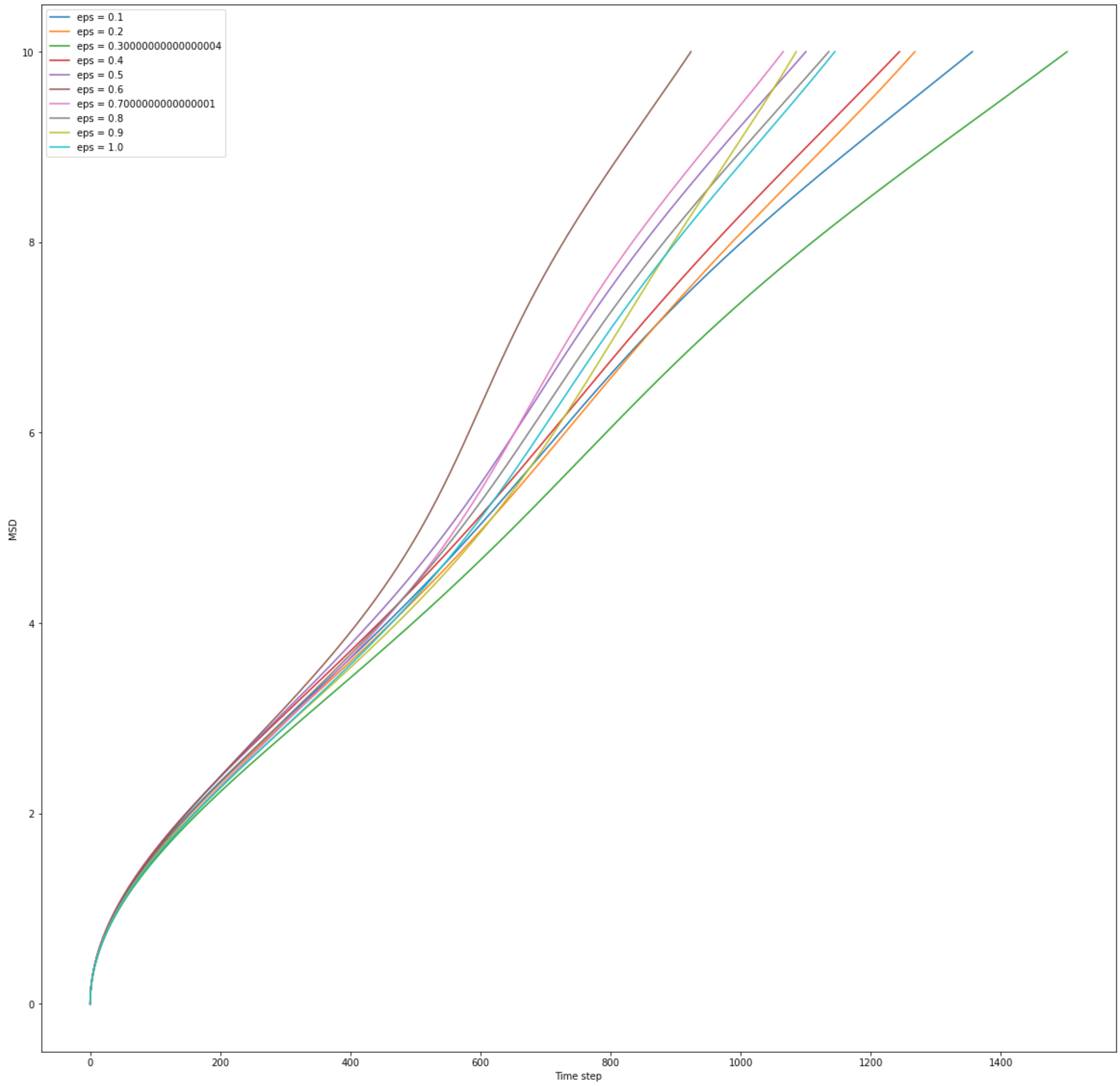
```
# Parameters
N = 100 # number of monomers
L = 10 # distance between monomers
k = 6 # spring constant
eps=0.5 # drag coefficient
dt=0.01 # time step
nsteps=1000 # number of steps
T= 300
m=124
```





As we can observe, the MSD shows an initial subdiffusive behaviour at short time and shows diffusive behaviour at longer times.

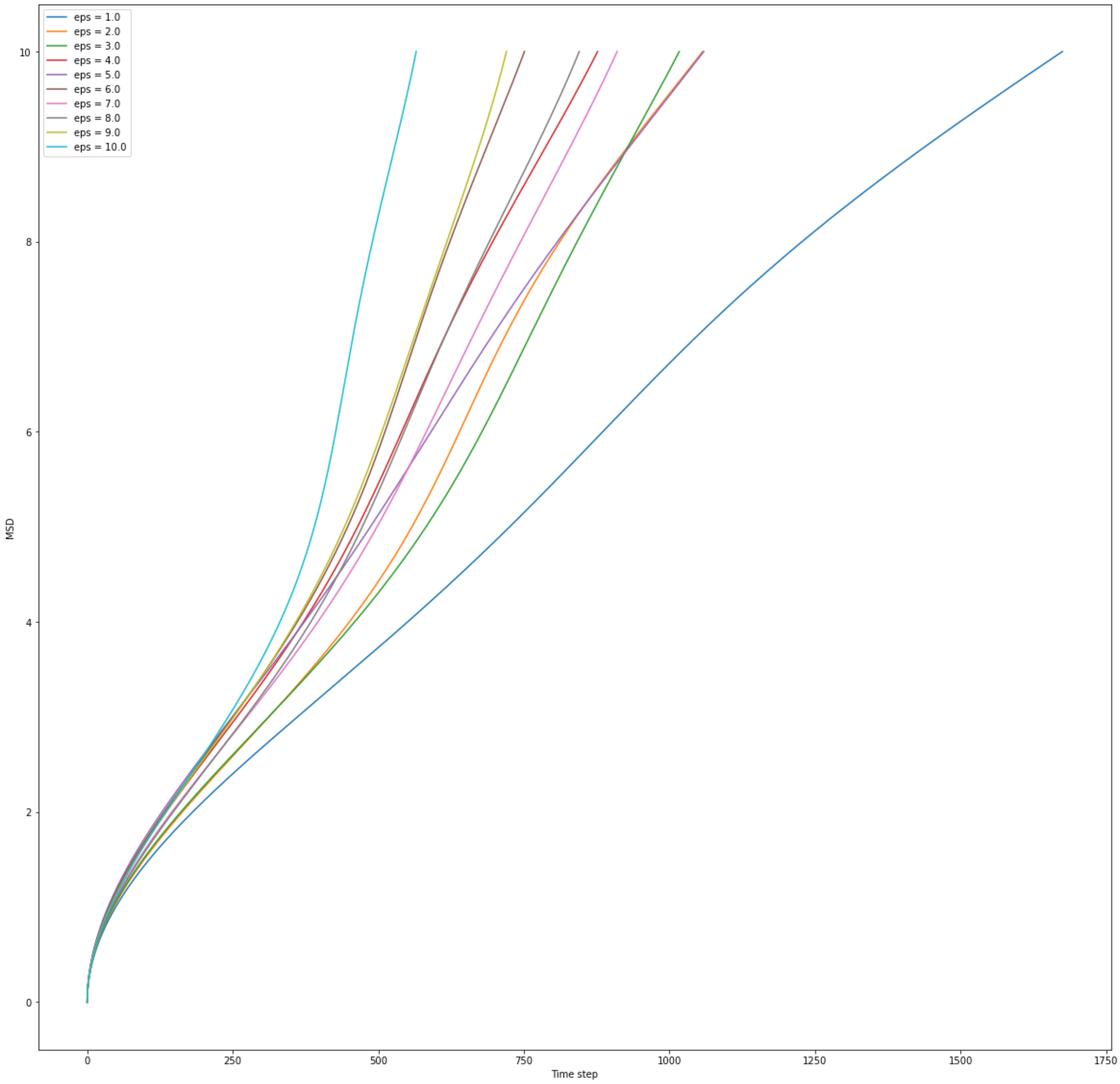
```
N=100 # number of monomers
L=10 # distance between monomers
k=6 # spring constant

dt=0.01 # time step
nsteps=1000 # number of steps
T=300 # temperature
m=124 # mass of monomer

# make eps a list of values
eps = np.linspace(0.1, 1.0, 10)
```



MSD for various environmental damping coefficient values.

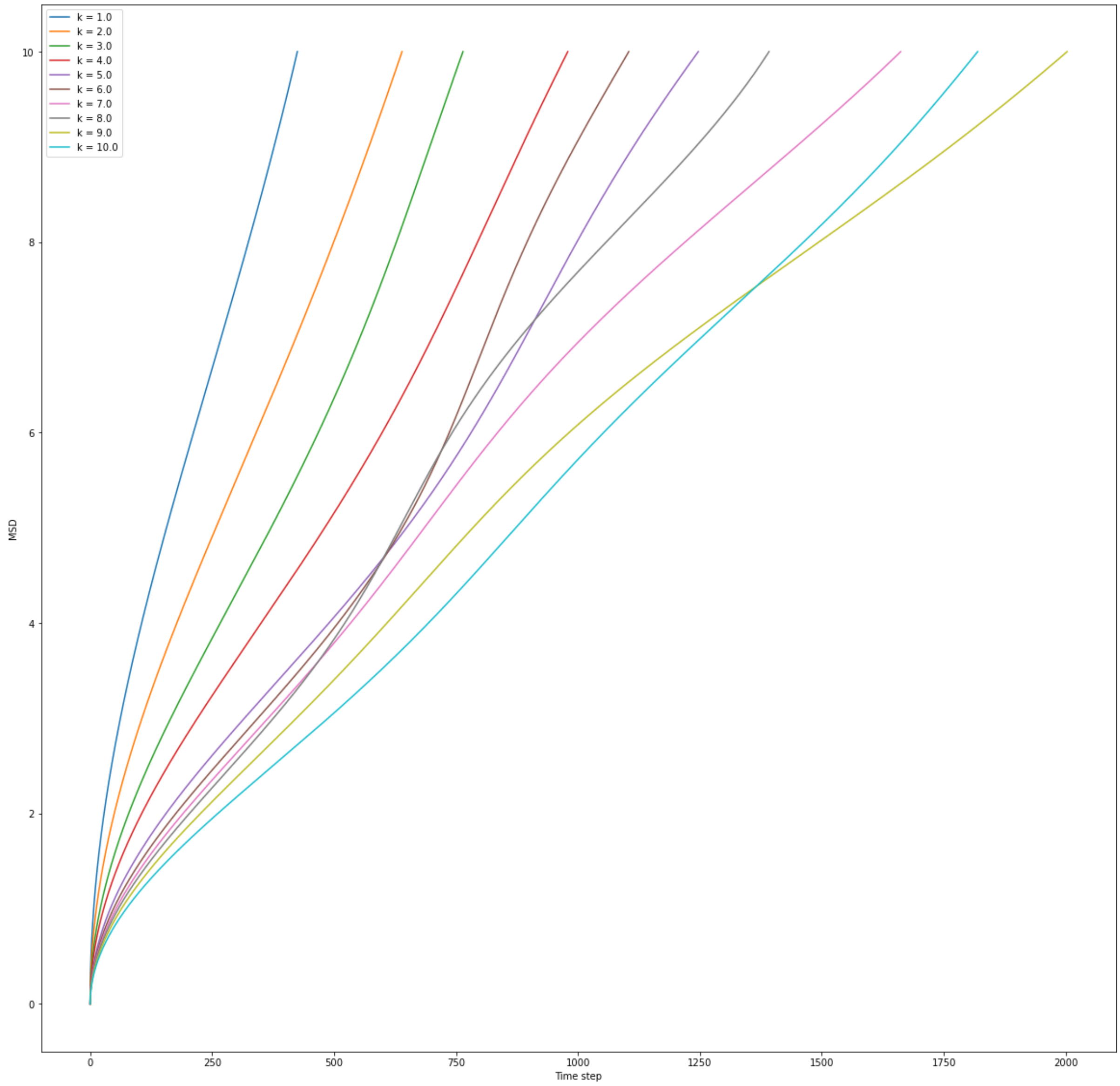
$$MSD \propto t^{\zeta}$$

```python
N=100 # number of monomers
L=10 # distance between monomers
k=6 # spring constant

dt=0.01 # time step
nsteps=1000 # number of steps
T=300 # temperature
m=124 # mass of monomer

# make eps a list of values
eps = np.linspace(1, 10, 10)
```



Plot for varying damping coefficient.

```python
N=100 # number of monomers
L=10 # distance between monomers
k=6 # spring constant
eps=0.5
dt=0.01 # time step
nsteps=1000 # number of steps
T=300 # temperature
m=124 # mass of monomer

# make eps a list of values
k = np.linspace(1,10,10)
```



MSD for varying spring constant

$$MSD \propto t^{\frac{1}{k}}$$

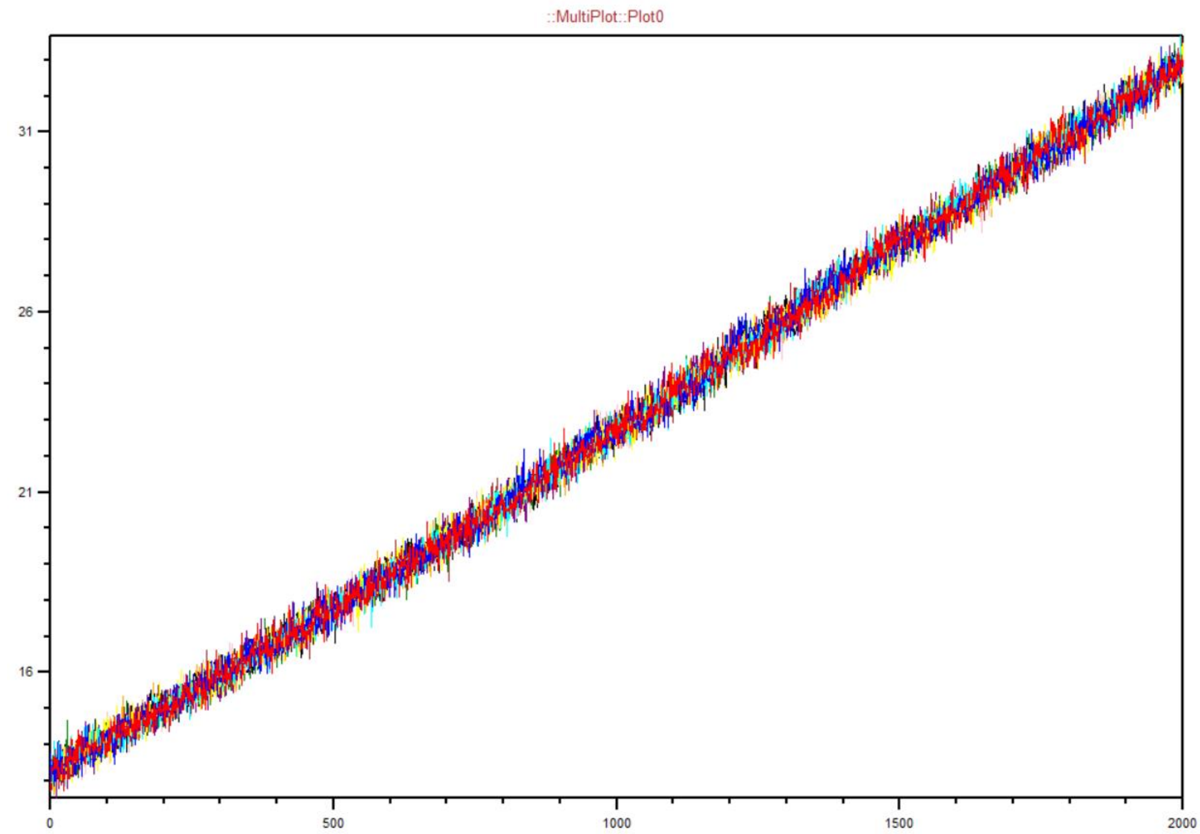


Figure 1: Extension versus time for 10 pulling trajectories.

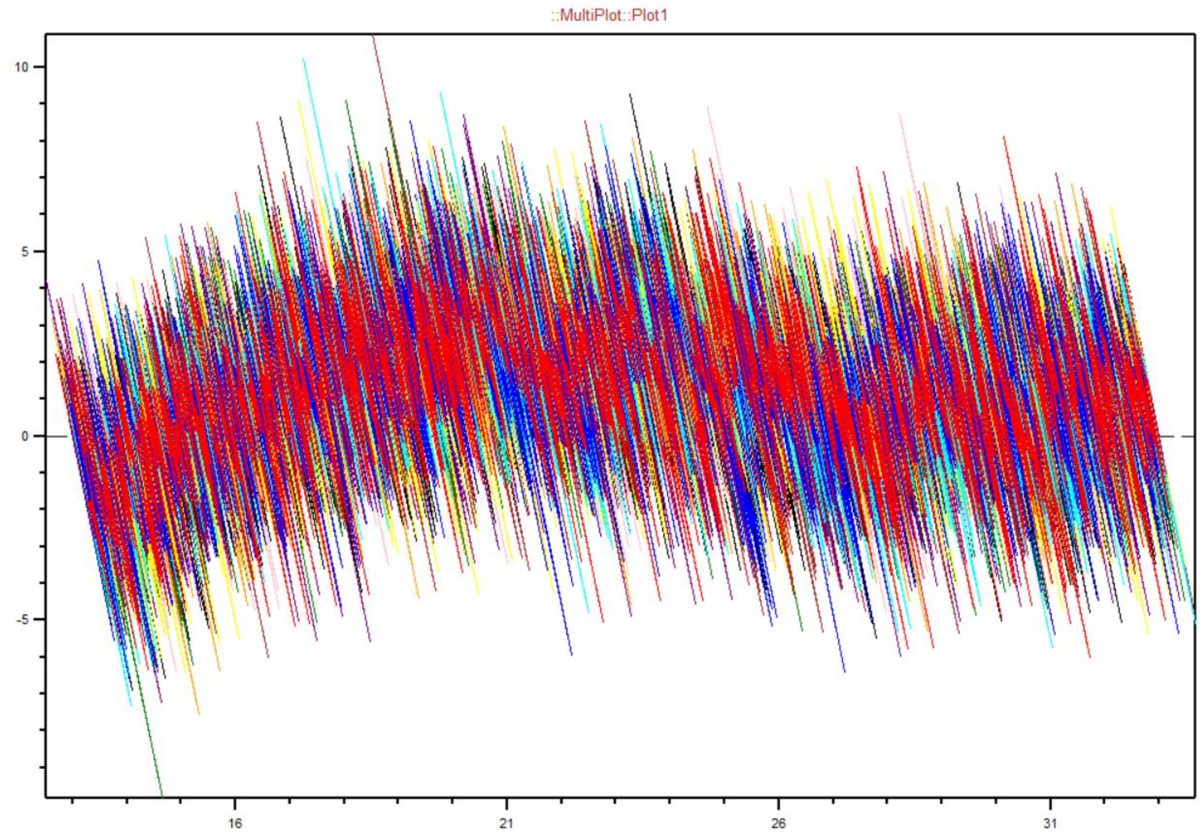


Figure 2: Extension versus time for 10 pulling trajectories.

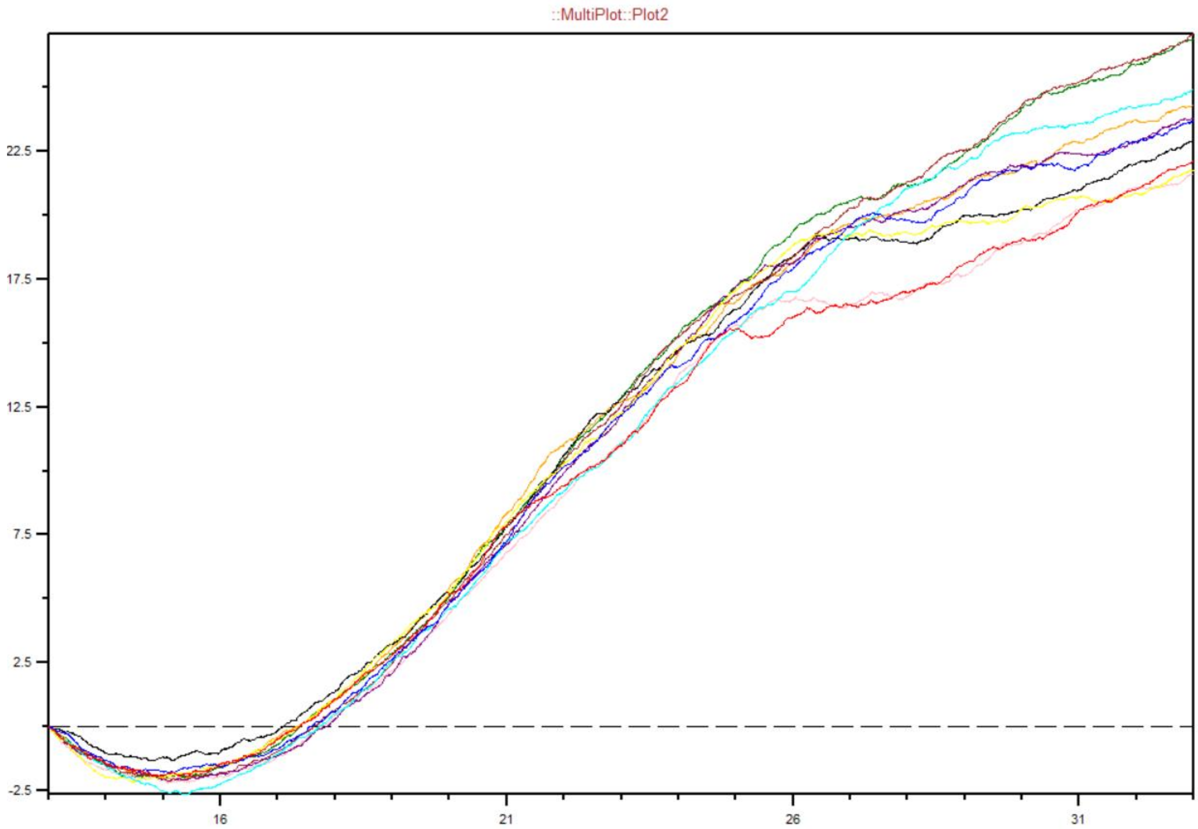


Figure 3: Work versus extension for 10 pulling trajectories. Fexact, obtained from reversible

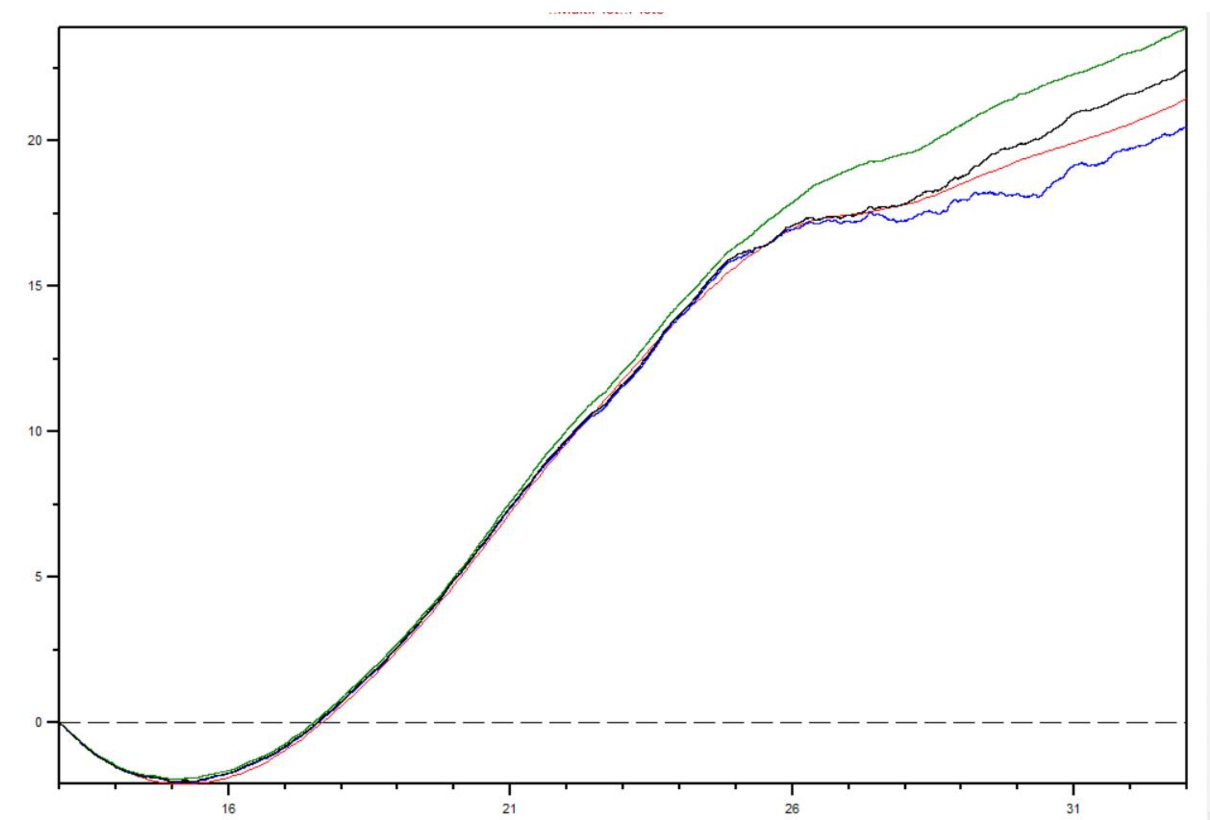


Figure 4: The PMF obtained from the cumulant expansion of Jarzynski's equality, compared with the PMF obtained from reversible pulling simulation (shown in red).