Figure S1

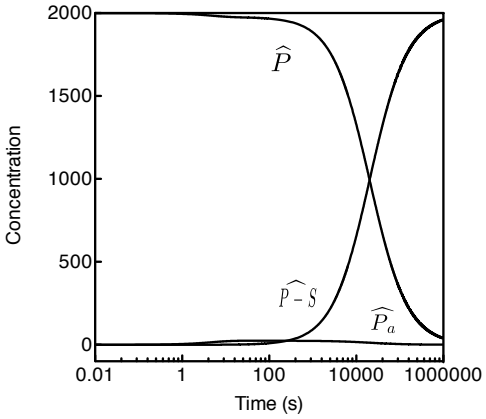

2000
1500
1000
500
0
Concentration
$\widehat{P}$
$\widehat{P-S}$
$\widehat{P_a}$
0.01
1
100
10000
1000000
Time (s)

Figure S2

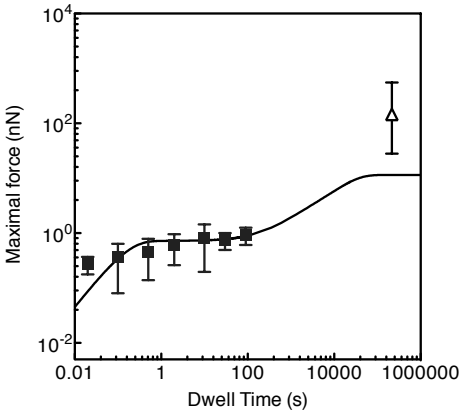

Maximal force (nN)
10^4
10^2
10^0
10^{-2}
0.01
1
100
10000
1000000
Dwell Time (s)

Figure S3

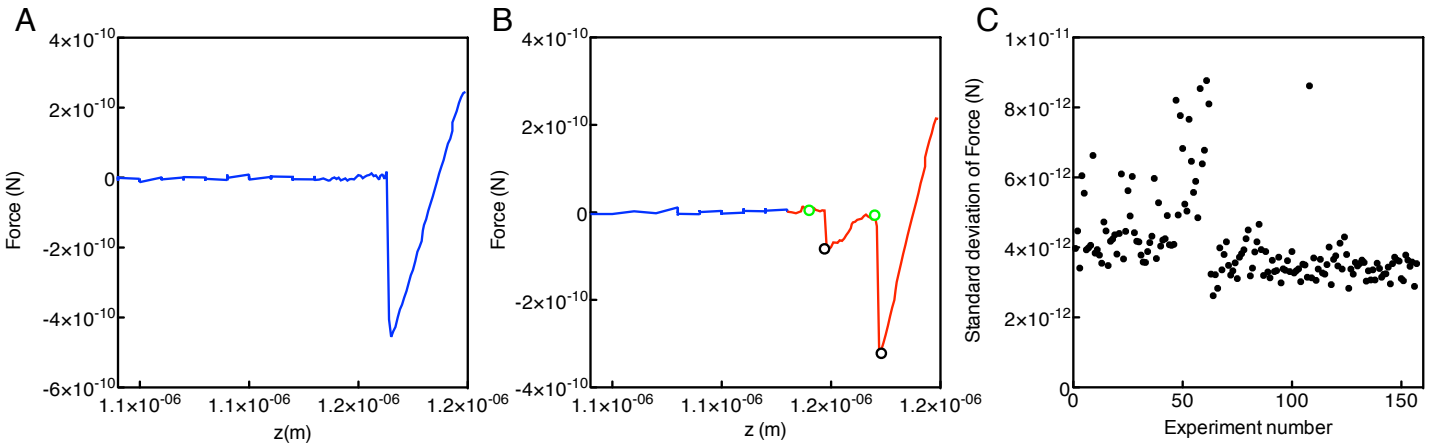

A
B
C
Force (N)
z(m)
z (m)
Standard deviation of Force (N)
Experiment number
4×10-10
2×10-10
0
-2×10-10
-4×10-10
-6×10-10
1.1×10-06
1.2×10-06
1×10-11
8×10-12
6×10-12
4×10-12
2×10-12
0
50
100
150

Figure S4

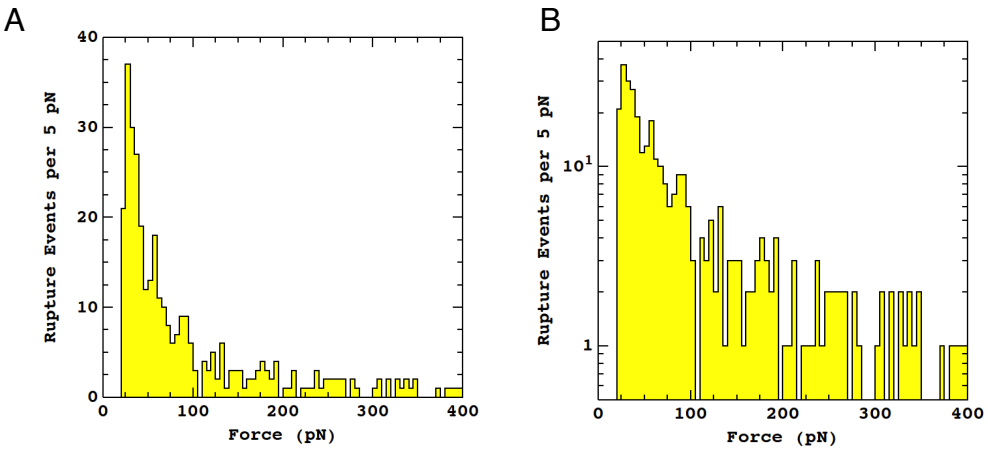

A
B
Rupture Events per 5 pN
Force (pN)
0
10
20
30
40
100
200
300
400
10^1
1

Figure S5

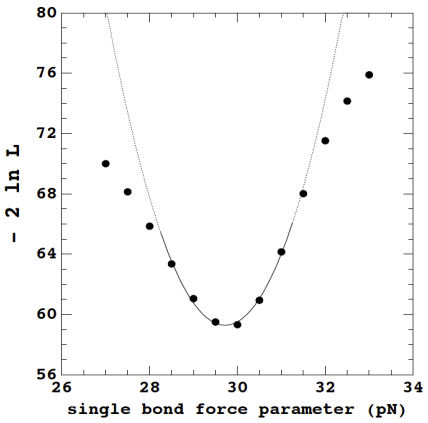
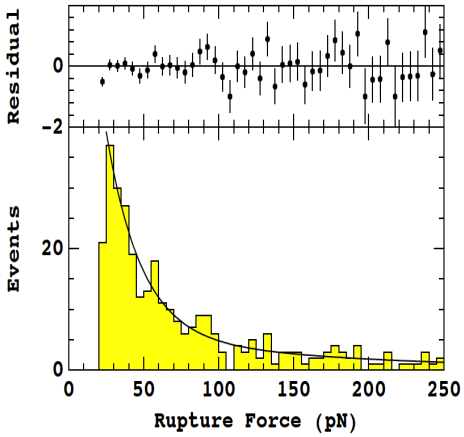

80
76
72
68
64
60
56
- 2 ln L
26
28
30
32
34
single bond force parameter (pN)

Figure S6

A


Residual
0
-2
Events
20
0
0
50
100
150
200
250
Rupture Force (pN)

B

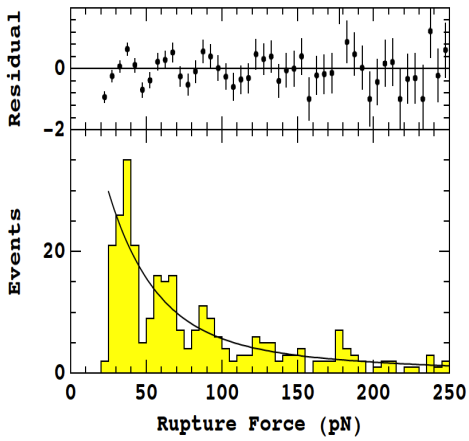
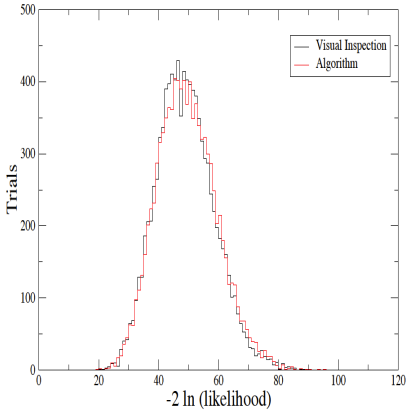

Residual
0
-2
Events
20
0
0
50
100
150
200
250
Rupture Force (pN)

Figure S7


Visual Inspection
Algorithm
Trials
-2 ln (likelihood)
0
100
200
300
400
500
0
20
40
60
80
100
120