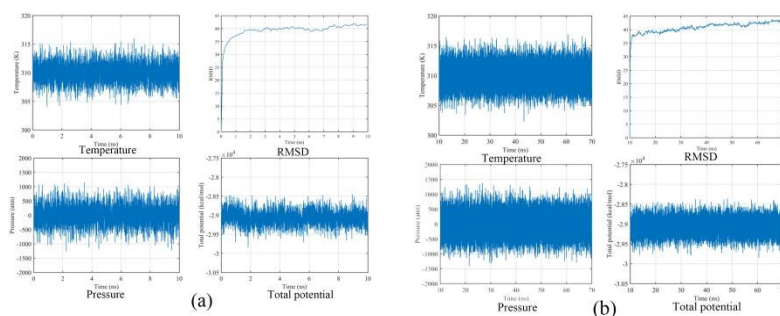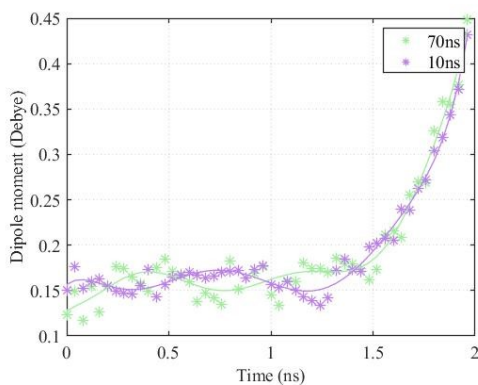# Supplementary material

Fig. S1. (a) 0ns-10ns, (b) 10ns-70ns phospholipid membrane equilibrium. Both (a) and (b) fluctuated in the same range.

Fig. S2. The 10ns represented the simulation of applying 2ns pulse after the production time reached 10ns. The 70ns represented the simulation of production time reached 70ns. The dipole moment values were the average values taken after several simulations.

Tab. S1. The statistical parameters of 1ns interval

	t_{ep} (ns)	IDM (debye)	SIP	SIW	EIP	EIW	t_{rep} (ns)	NIDM (debye)
Destabilizing	1.776	0.2754	8	172	1	14	0.39	0.1389
	1.900	0.1427	3	49	1	18	0.50	0.1297
	1.660	0.4889	9	176	3	42	0.04	0.1672
	1.794	0.2895	9	126	1	36	0.002	0.1318
Retaining	1.000	0.4021	5	138	4	62		0.2006
	1.750	0.3816	13	212	6	116		0.2302
	1.780	0.4157	7	87	3	55		0.1176
	1.400	0.7285	12	360	7	158		0.2190
	1.716	0.4543	8	142	2	57		0.1578
	1.760	0.5048	7	144	3	61		0.1250
	1.640	0.4877	11	225	5	116		0.0774
	1.600	0.6245	9	252	5	87		0.1274

Note: In the table, SIP is the P_N at the beginning of the interval, SIW is the W_N at the beginning of the interval, EIP is the P_N at the end of the interval, and EIW is the W_N at the end of the interval, NIDM is the IDM of phospholipid membrane at the beginning of negative pulse. The value of P_N is too small relative to W_N, so it is used as the amplitude reference data.

Tab. S2. The statistical parameters of 5ns interval

	t_{ep} (ns)	IDM (debye)	SIP	SIW	EIP	EIW	t_{rep} (ns)	NIDM (debye)
Resealing	1.760	0.2181	3	75	0	1	0.39	0.1445
	1.940	0.1699	5	63	0	5	0.50	0.1414
Destabilizing	1.610	0.3023	3	82	2	56	0.04	0.1295
	1.600	0.3618	6	111	4	30	0.002	0.1940
	1.600	0.5675	7	194	4	51		0.1464
Retaining	1.760	0.3120	9	124	3	52		0.1165
	1.300	0.9913	16	397	11	178		0.0200
	1.240	0.8011	16	334	7	74		0.0494
	1.080	1.2115	13	384	10	164		0.2093
	1.200	1.1105	18	425	16	241		0.1537
	1.180	0.6478	14	252	5	54		0.1753
	1.700	0.4896	9	133	4	56		0.1168

Tab. S3. The statistical parameters of 10ns interval

	t_{ep} (ns)	IDM (debye)	SIP	SIW	EIP	EIW	t_{rep} (ns)	NIDM (debye)
Resealing	1.500	0.6198	16	311	0	6	1.250	0.0917
	1.840	0.2829	3	96	0	14	1.794	0.0399
	1.940	0.1699	4	84	0	6	-	0.1124
	1.768	0.3112	8	83	0	7	-	0.0696
	1.774	0.3106	2	259	0	16	-	0.1215
	1.700	0.4293	10	145	0	1	1.870	0.1364
	1.780	0.3052	3	78	0	3	1.500	0.1014
	1.760	0.4757	10	215	0	12	-	0.0857
Destabilizing	1.760	0.3120	14	128	4	52	0.060	0.0456
Retaining	1.278	0.6660	14	350	7	107		0.1702
	1.460	0.6864	10	249	4	54		0.1333
	1.300	0.7017	11	381	7	72		0.1741

Note: The phospholipid membranes did not produce EP after applying negative pulses to some simulations, denoted by -.