Supplemental Material on Lipid bilayer adhesion on sparse DNA carpets: theoretical analysis of membrane deformations induced by single end-grafted polymers.

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(Dated: May 7, 2011)

We provide as Auxiliary Material a selection of deformation profiles obtained with the numerical procedure introduced in the Section IV of the main article. We also provide correspondance Tables relating the fixed adhesion w situation and the fixed radius L situation.

I. SELECTION OF SELF-CONSISTENT QUANTITATIVE PROFILES

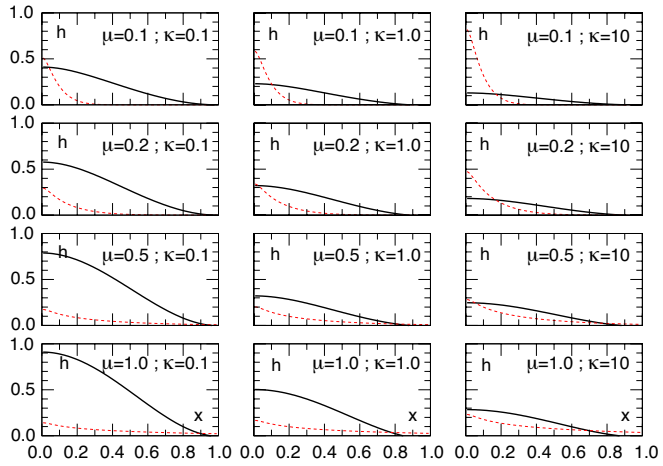

FIG. 1: Self-consistent solution for $\nu = 0.1$, $L = 1.0$, $T = 1.0$: from top to bottom and from left to right, $\kappa = 0.1$, $\gamma = 10^{-3}$, $R_g = 0.1, 0.2, 0.5, 1.0$; $\kappa = 1$, $\gamma = 10^{-2}$, $R_g = 0.1, 0.2, 0.5, 1.0$; $\kappa = 10$, $\gamma = 0.1$, $R_g = 0.1, 0.2, 0.5, 1.0$. The pressure is shown in the same arbitrary units for all plots, as dashed lines.

The deformation profiles depend on three independant dimensionless combination of parameters. These parameters, introduced in Appendix C and D, are $\nu = L/\xi$, $\mu = R_g/\xi$ and $\overline{\kappa} = \beta\kappa$, where $\xi = \sqrt{\kappa/\gamma}$ is the length scale where tension and curvature contribution match. L serves as the unit of length and k_BT as the unit of energy. Due to the large number of possible cases, we provide only a sample of the possible self-consistent profiles.

Figures (**??**),(**??**) and (**??**) present mosaic-like sets of profiles obtained for $\nu = 0.1$ (curvature dominated case), $\nu = 1$ (curvature and tension of same order of magnitude) and $\nu = 10$ (tension dominated case, see caption for precise values). This total of 36 pictures correspond to a sampling of the three-dimensional parameter space $(\nu, \mu, \overline{\kappa})$ associated to the present problem.

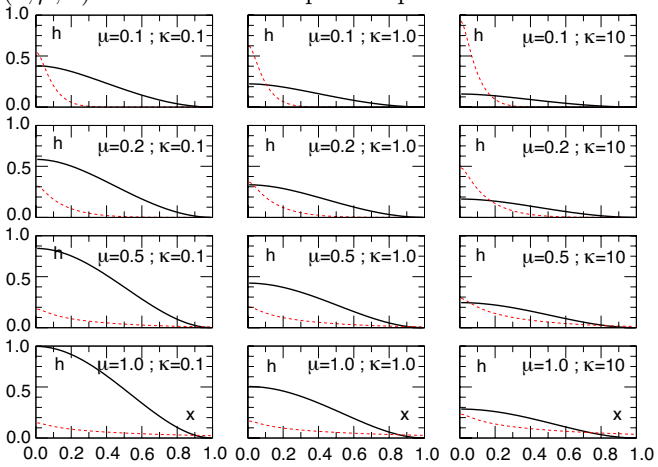

FIG. 2: Self-consistent solution for $\nu = 1.0$, $L = 1.0$, $T = 1.0$: from top to bottom and from left to right, $\kappa = 0.1$, $\gamma = 0.1$, $R_g = 0.1, 0.2, 0.5, 1.0$; $\kappa = 1.0$, $\gamma = 1.0$, $R_g = 0.1, 0.2, 0.5, 1.0$; $\kappa = 10$, $\gamma = 10$, $R_g = 0.1, 0.2, 0.5, 1.0$. The pressure is shown in the same arbitrary units for all plots, as dashed lines.

II. PROFILES WITH FIXED ADHESION w

When the adhesion parameter w is fixed, one must determine the corresponding patch radius L. This amounts to solving a non-linear relation $w(L)$ for L. Table **??** provides a correspondence between the dimensionless parameters $\overline{\kappa} = \kappa/T$, $\overline{\gamma} = \gamma R_g^2/T$ and $\overline{w} = wR_g^2$ and the a priori unknown ratio L/R_g. Parameters μ and ν are also provided for completeness. Once the correspondence between w and L has been established, it is possible to refer to Figs (**??**), (**??**) and (**??**) in order to find out the actual profile. Table **??** gives the aspect ratio and D/L and the adhesion parameter wL^2/T in units L, T corresponding to each triplet of parameters $(\overline{\kappa}, \nu, \mu)$.

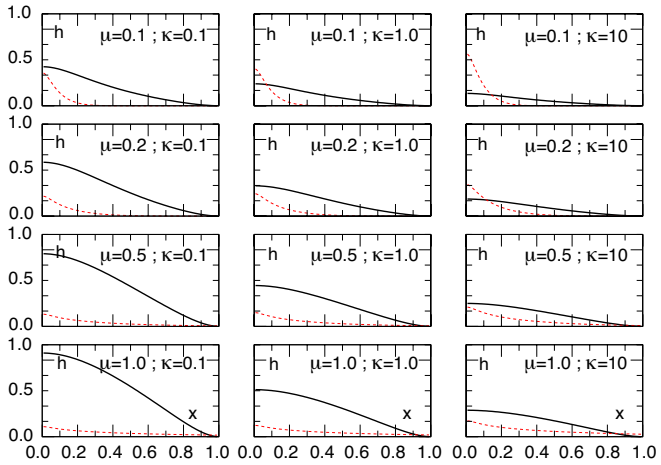

FIG. 3: Self-consistent solution for $\nu = 10.$, $L = 1.0$, $T = 1.0$: from top to bottom and from left to right, $\kappa = 0.1$, $\gamma = 10.$, $R_g = 0.1, 0.2, 0.5, 1.0$; $\kappa = 1.0$, $\gamma = 100.$, $R_g = 0.1, 0.2, 0.5, 1.0$; $\kappa = 10$, $\gamma = 1000$, $R_g = 0.1, 0.2, 0.5, 1.0$. The pressure is shown in the same arbitrary units for all plots, as dashed lines.

b

$\overline{\kappa}$	$\overline{\gamma}$	$\overline{w}$	L/R_g	D/R_g	$\mu = R_g/L$	ν
0.10	0.10	10.02	0.50	0.498	2.00	0.50
0.10	0.10	0.997	1.27	1.082	0.79	1.27
0.10	0.10	0.100	2.80	1.82	0.36	2.80
0.10	1.00	10.09	0.505	0.484	1.98	1.60
0.10	1.00	0.999	1.337	0.948	0.75	4.22
0.10	1.00	0.101	3.030	1.313	0.33	9.58
0.10	10.0	9.999	0.587	0.425	1.70	5.87
0.10	10.0	0.9996	1.79	0.673	0.56	17.9
0.10	10.0	0.1004	4.03	0.818	0.25	40.3
1.00	0.10	9.91	0.807	0.429	1.24	0.255
1.00	0.10	0.996	1.93	0.863	0.52	0.610
1.00	0.10	0.1007	4.02	1.410	0.25	0.271
1.00	1.00	10.02	0.813	0.425	1.23	0.813
1.00	1.00	1.007	1.93	0.820	0.518	1.93
1.00	1.00	0.1006	3.96	1.199	0.253	3.96
1.00	10.0	10.02	0.837	0.400	1.20	2.65
1.00	10.0	1.003	2.078	0.653	0.48	6.57
1.00	10.0	0.1006	4.37	0.805	0.23	13.8
10.0	0.10	–	–	–		
10.0	0.10	0.998	2.825	0.635	0.35	0.28
10.0	0.10	0.1004	5.76	1.006	0.18	1.80
10.0	1.00	10.03	1.272	0.351	0.786	0.402
10.0	1.00	0.9980	2.825	0.635	0.354	0.893
10.0	1.00	0.1003	5.68	0.956	0.176	1.796
10.0	10.0	10.01	1.278	0.344	0.78	1.28
10.0	10.0	0.9999	2.818	0.577	0.36	2.82
10.0	10.0	0.1003	5.51	0.752	0.18	5.51

TABLE I: This table lists the values of L associated with prescribed values of adhesion $\overline{w}$.

$\overline{\kappa}$	ν	μ	D/L	wL^2/T
0.10	0.10	0.10	0.3807	2.419×10^{-3}
0.10	0.10	0.20	0.5255	2.654×10^{-2}
0.10	0.10	0.50	0.6657	0.7703
0.10	0.10	1.00	0.7122	8.057
1.00	0.10	0.10	0.2646	2.190×10^{-3}
1.00	0.10	0.20	0.3791	1.924×10^{-2}
1.00	0.10	0.50	0.5515	0.2434
1.00	0.10	1.00	0.6609	1.2865
10.0	0.10	0.10	0.1585	4.734×10^{-3}
10.0	0.10	0.20	0.2285	4.025×10^{-2}
10.0	0.10	0.50	0.3371	0.4658
10.0	0.10	1.00	0.4071	2.364
0.10	1.00	0.10	0.4039	1.507×10^{-3}
0.10	1.00	0.20	0.5672	1.504×10^{-2}
0.10	1.00	0.50	0.7759	0.2791
0.10	1.00	1.00	0.8965	1.8534
1.00	1.00	0.10	0.2272	4.856×10^{-3}
1.00	1.00	0.20	0.3190	4.843×10^{-2}
1.00	1.00	0.50	0.4365	0.8987
1.00	1.00	1.00	0.5043	5.9678
10.0	1.00	0.10	0.1277	1.537×10^{-2}
10.0	1.00	0.20	0.1794	0.1535
10.0	1.00	0.50	0.2455	2.8484
10.0	1.00	1.00	0.2836	18.913
0.10	10.0	0.10	0.2543	1.264×10^{-3}
0.10	10.0	0.20	0.3511	1.573×10^{-2}
0.10	10.0	0.50	0.4739	0.4481
0.10	10.0	1.00	0.5459	3.5954
1.00	10.0	0.10	0.1430	4.071×10^{-3}
1.00	10.0	0.20	0.1975	5.066×10^{-2}
1.00	10.0	0.50	0.2664	1.442
1.00	10.0	1.00	0.3070	11.58
10.0	10.0	0.10	0.0804	1.290×10^{-2}
10.0	10.0	0.20	0.1111	0.1605
10.0	10.0	0.50	0.1498	4.5675
10.0	10.0	1.00	0.1726	36.651

TABLE II: This table lists the values of $\overline{w}$ associated with prescribed values of adhesion L.