Supporting Information for

Characterizing Patterned Block Copolymer Thin Films with Soft X-rays

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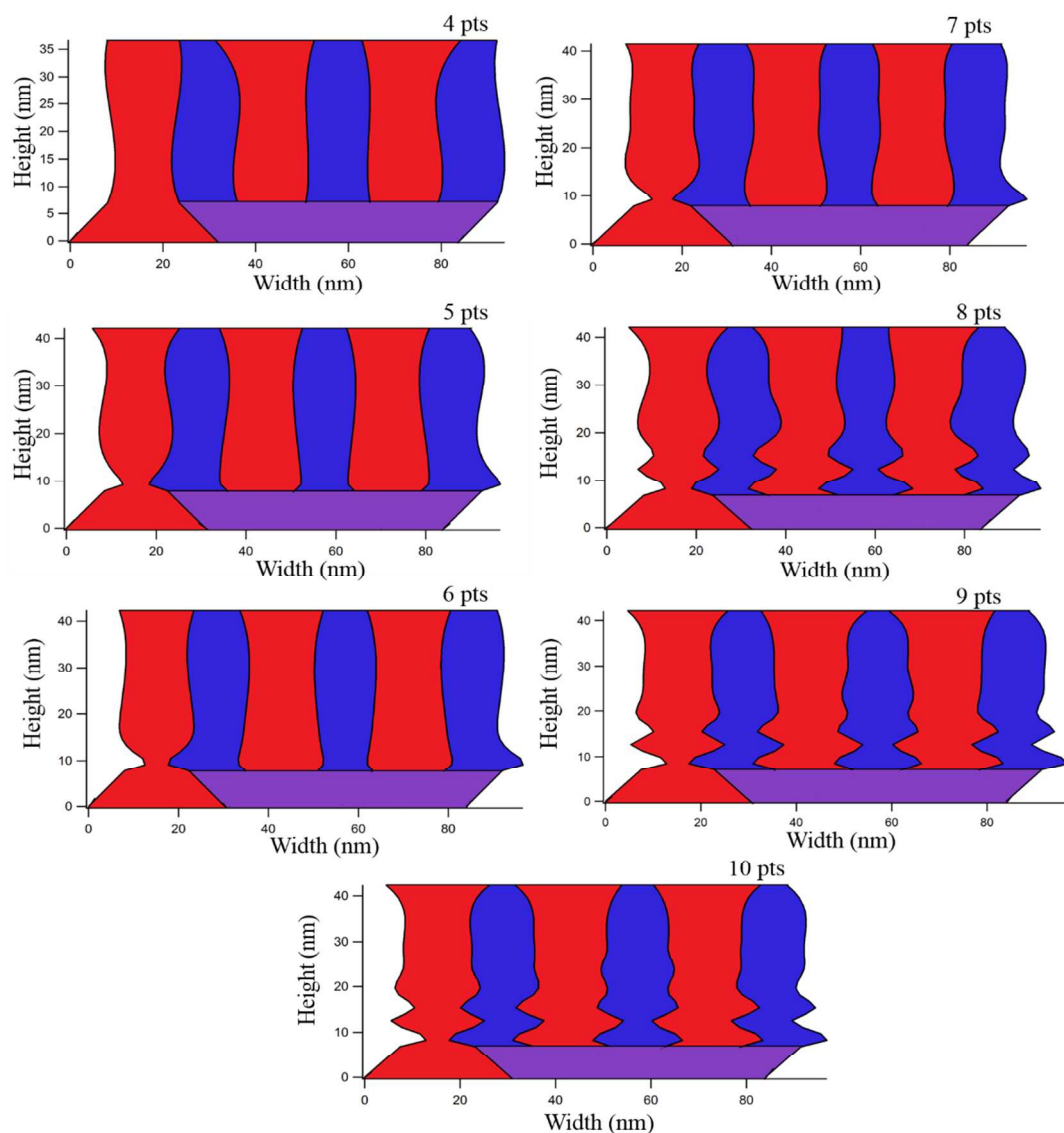3. IMEC, Kapeldreef 75, B-3001 Leuven, Belgium

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Figure S1: Best fit for $W/L_o = 0.53$ as a function of the number of spline points. The narrowing above the X-PS stripe emerges with the addition of the 5th point and corresponds with a large improvement in the quality of the fit.
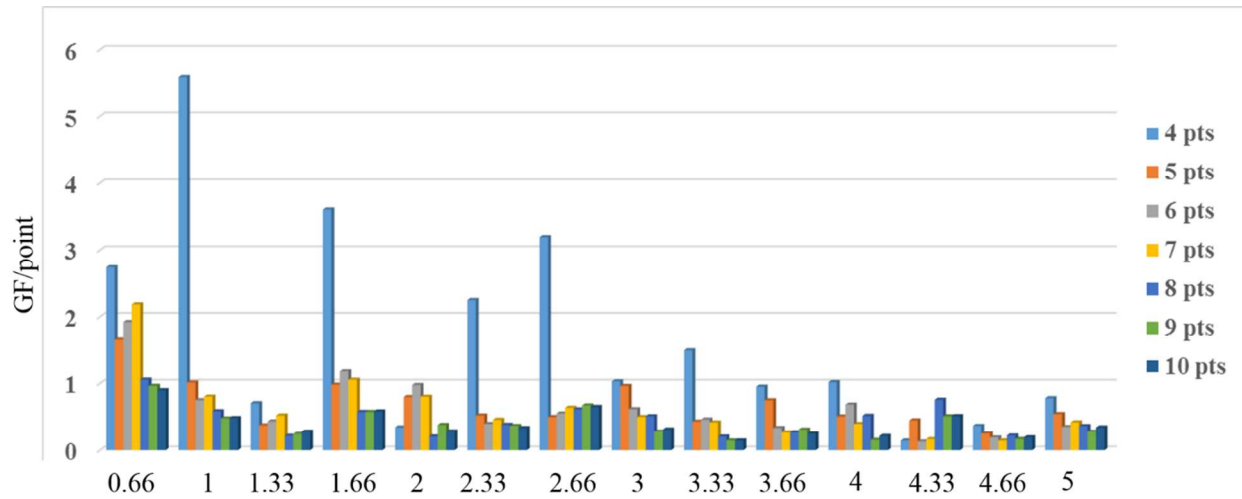

Figure S2: *GF*/point for each peak order shown in Figure 3 as a function of the number of spline points in the model.
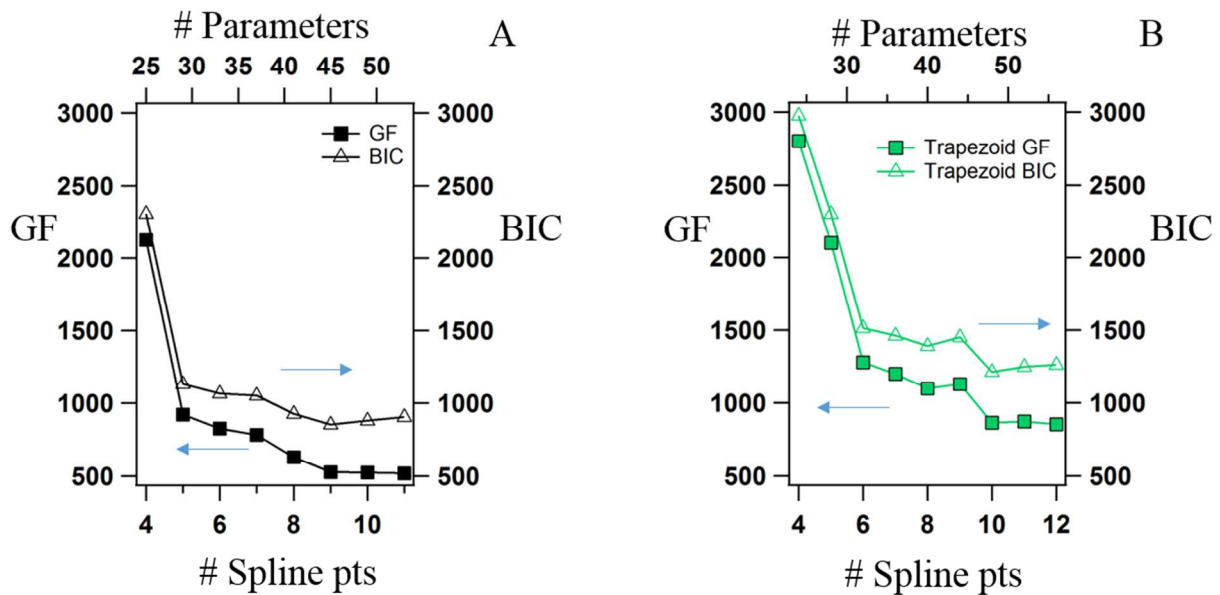

Figure S3: Comparison of the fit quality achieved for W/Lo = 0.53 between the model where the interface is guided by an interpolated spline and a model where the interface profile is defined solely by a stack of trapezoids. A) *GF* and *BIC* for interpolate spline model. B) *GF* and *BIC* for trapezoid stack model.
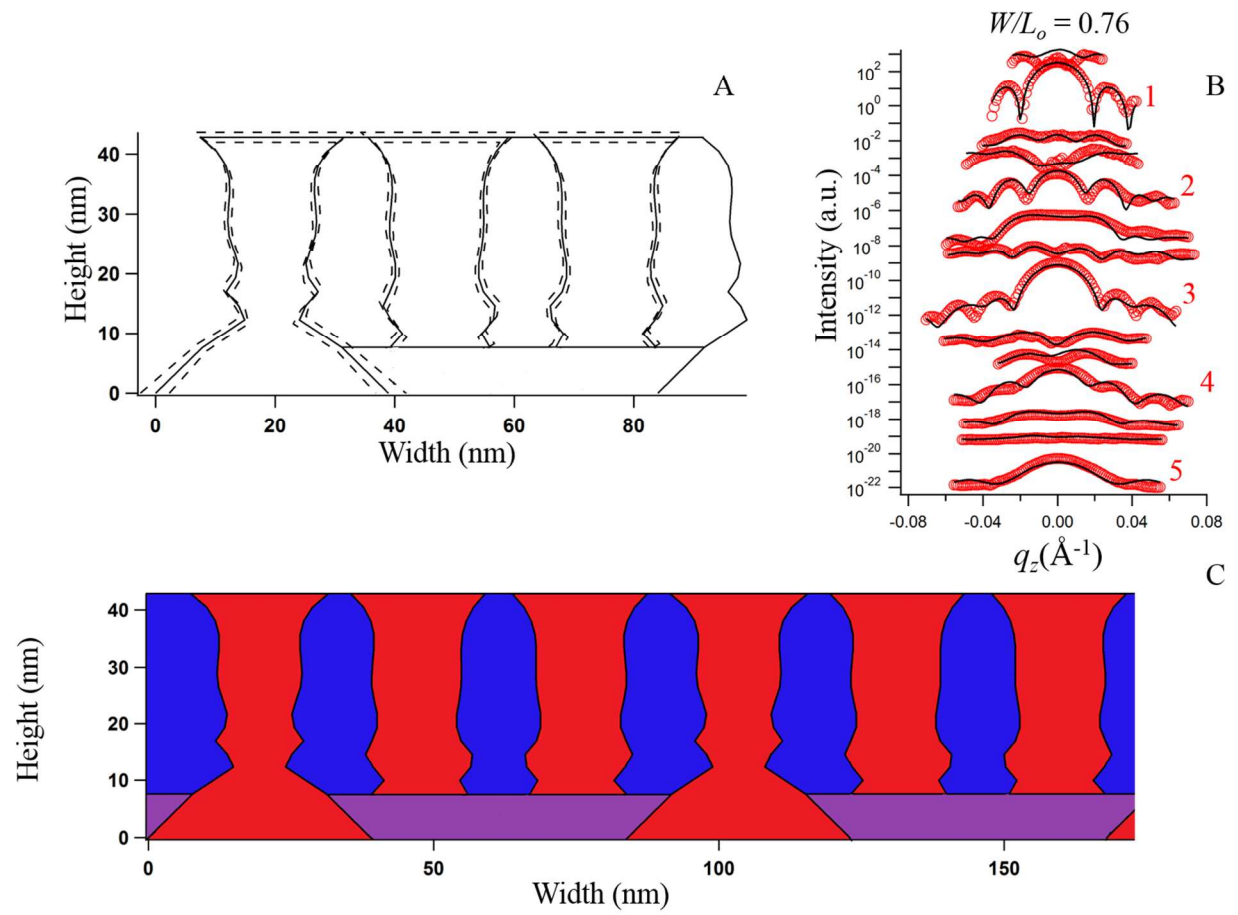
Figure S4: Results of res-CDSAXS measurements on W/L_o = 0.76, fit quality as a function of model points are shown in Figure S4. A) Best fit (solid Line) with 95 % confidence intervals (dashed line) from MCMC algorithm. B) Experimental (○) and simulated data (-). q_z cuts. C) Two unit cells of the best fit with red indicating PS, blue indicating PMMA and purple being the neutral brush.
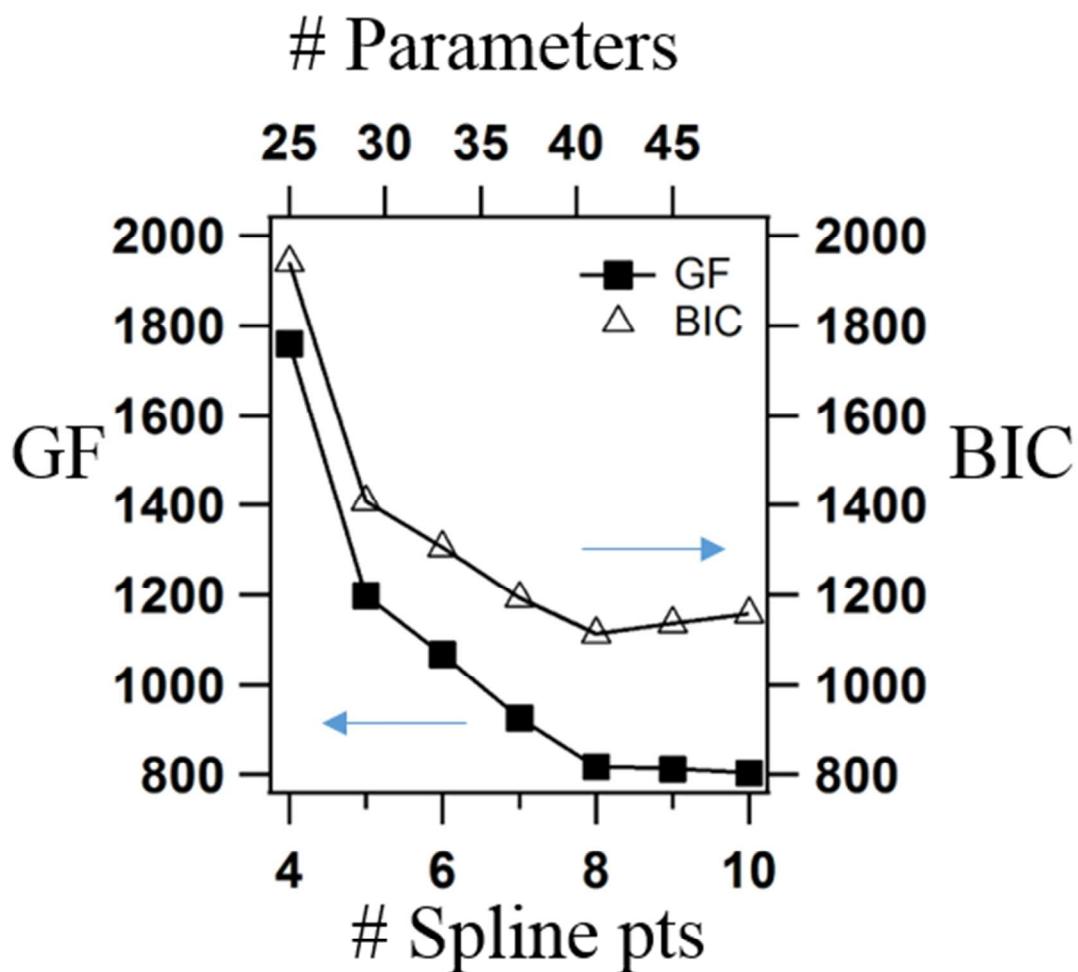
Figure S5: *GF* and *BIC* for $W/L_o = 0.76$ as a function of the number of spline points in the model.

Analysis of sample with undetermined W/L_o

Figure S6 shows the results of the analysis on a sample with undetermined W/L_o. Compared to the other samples the difference between both the *GF* and *BIC* for the three models is much smaller. The similarity between these three models makes definitive determination of the morphology of the sample difficult. The continuous lamella model reaches the lowest *BIC* overall for the model with 6 spline points, but that fit quality occurs for $W/L_o = 0.62$, which is much lower than expected. Similarly, the best fit for the broken lamella model occurs when the width of the line break is under 5 nm, (fit quality as a function of break width and position for the broken lamella model is shown in Table S1) a width that is incommensurate

with the thickness of the PMMA lamella. The structures of the best fits for all three models and the fits to

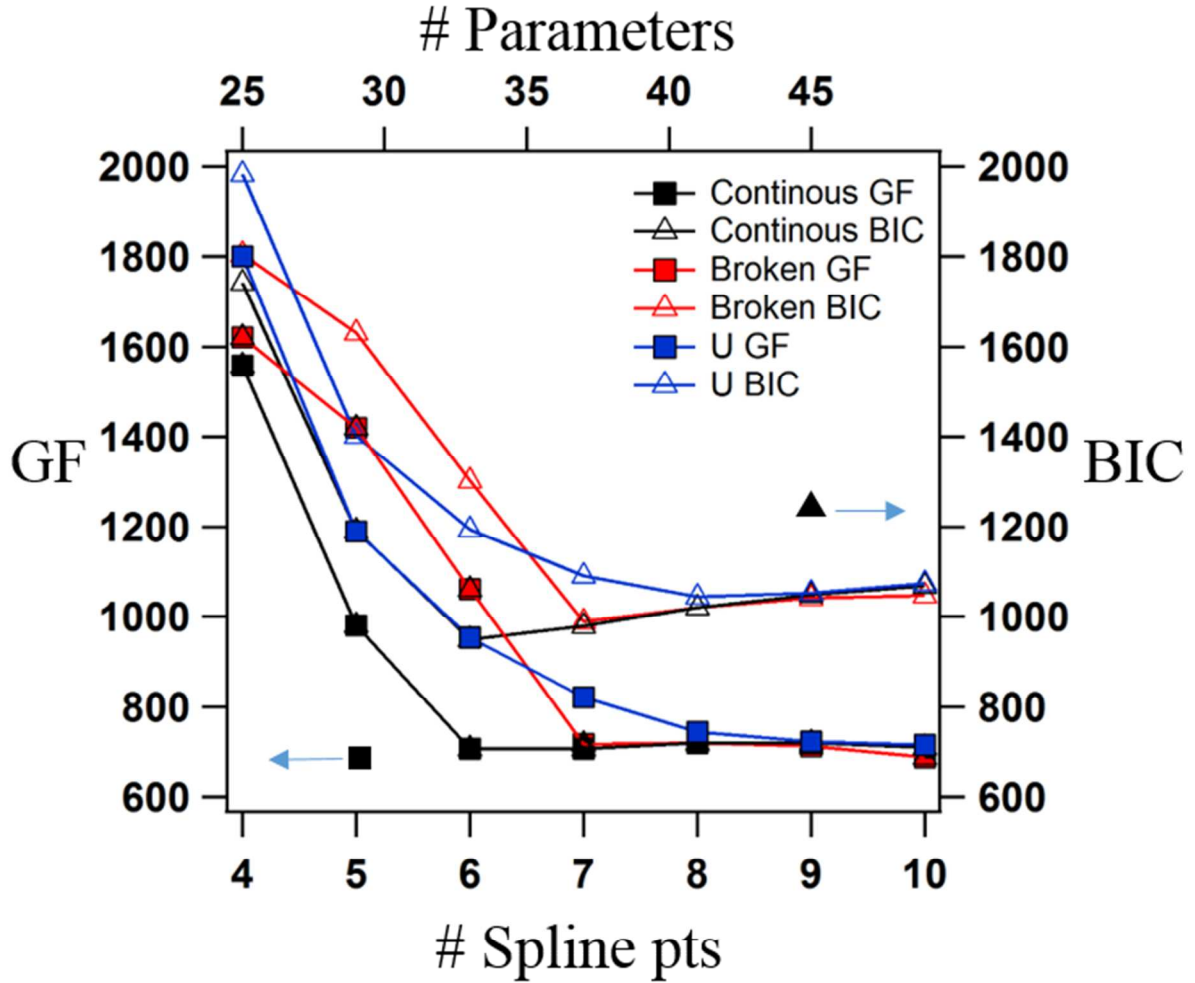the data for those models are shown in Figure S7 and S8, respectively.

Figure S6: *GF* (■) and *BIC* (Δ) for sample with undetermined *W/L*$_o$ as a function of the number of spline points for all three models tested, continuous PS lamella centered over the X-PS stripe (black), broken PS lamella centered over the X-PS stripe (red) and continuous lamella with PMMA centered over the X-PS stripe (blue).

	Break Width/PMMA Lamella Width						
Break Position (nm)	0.17	0.34	0.51	0.68	0.85	1.02	1.19
11.7	1112	718	1013	1269	1487	1849	2317
14.1	1172	893	1274	1032	1348	1743	2101
16,5	1096	1210	1187	1162	1521	1631	2074
18.9	987	1461	1077	1127	1249	1843	1939
21.3	1017	916	1029	1455	1636	1810	2237

Table S1: *GF* for the broken model as a function of break position and break width/PMMA lamella width.
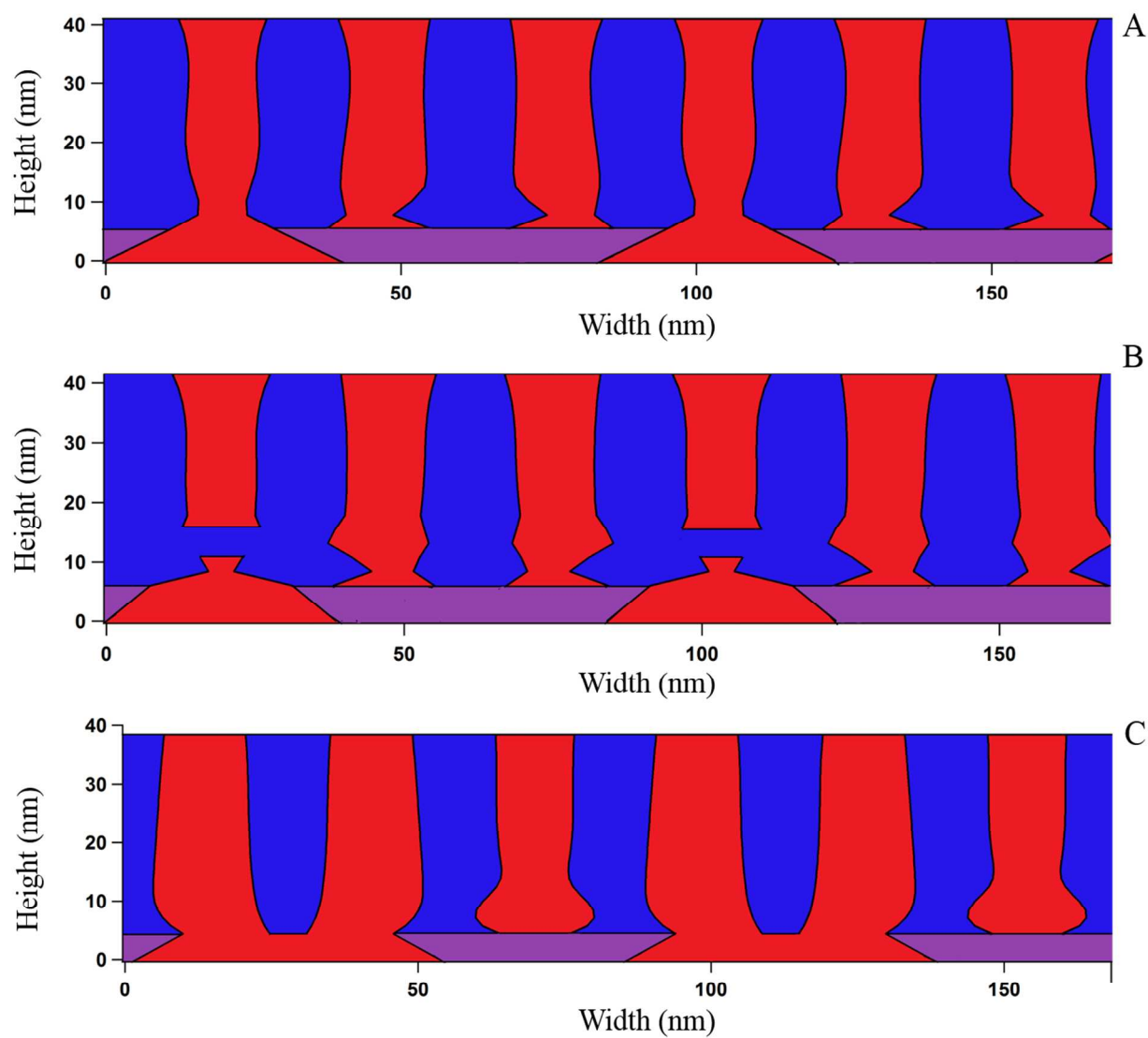

Figure S7: Structure of the best fit to the sample with undetermined W/L_o for continuous lamella with 6 spline points (A), broken lamella with 7 spline points (B) and U model with 8 spline points (C).
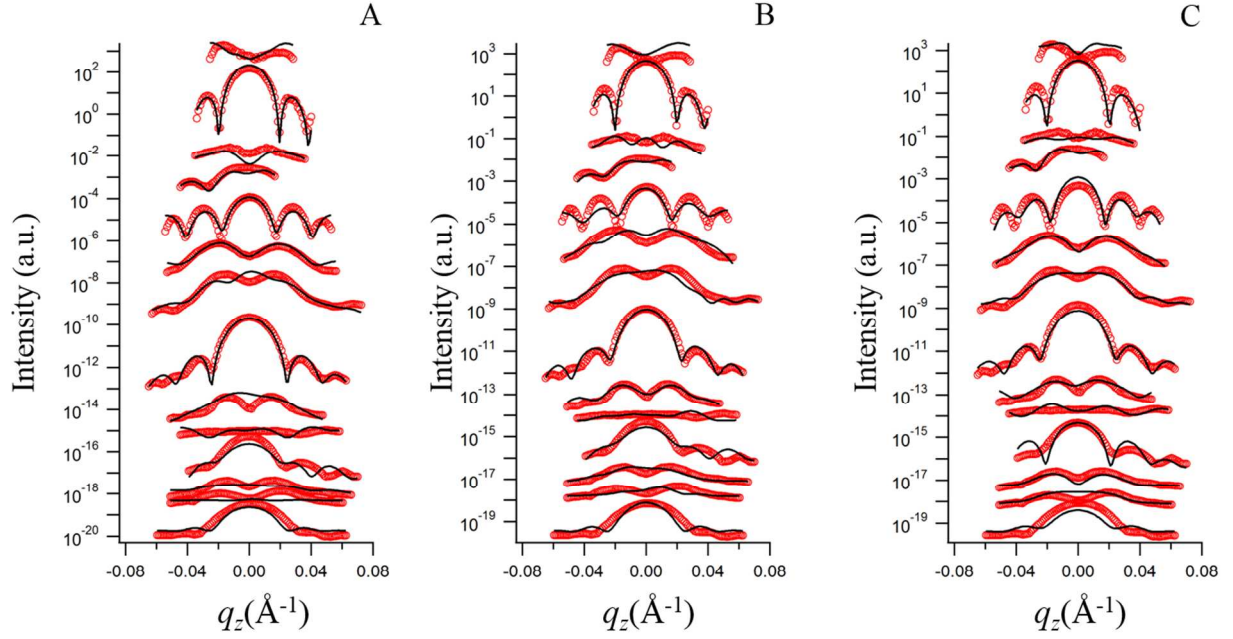
Figure S8: Experimental (○) and simulated data (-). q_z cuts for the sample with undetermined W/L_o for a model with continuous lamella with 6 spline points ($GF = 708$, $BIC = 949$) (A), broken lamella with 7 spline points ($GF = 718$, $BIC = 988$) (B) and U model with 8 spline points ($GF = 745$, $BIC = 1044$) (C).
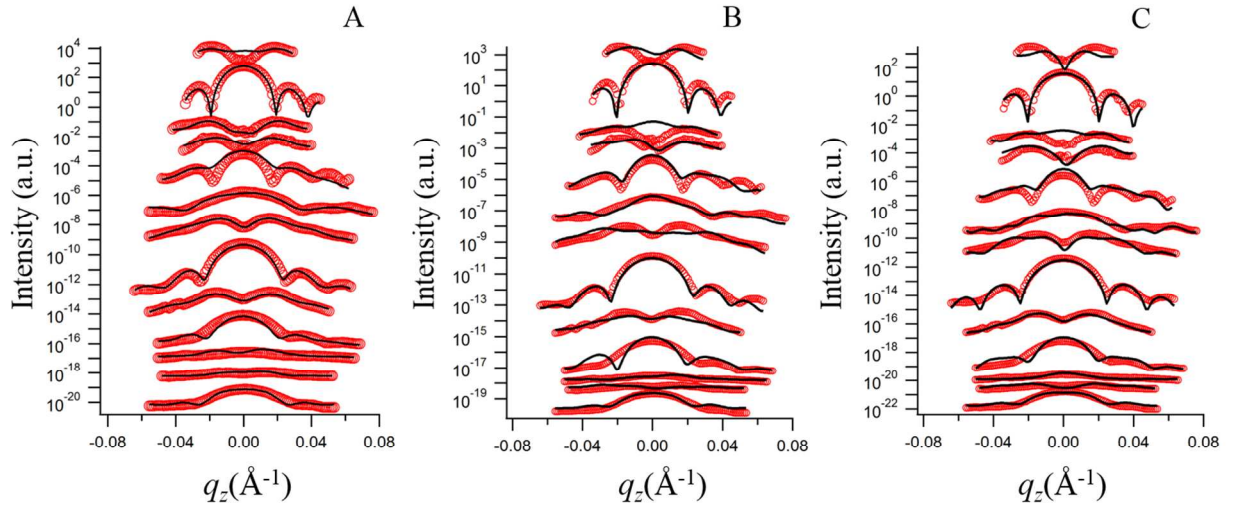

Figure S9: Experimental (○) and simulated data (-). q_z cuts for the sample with W/L_o =1.14 for the U model with 6 spline points ($GF = 558$, $BIC = 799$) (A), broken lamella with 6 spline points ($GF = 1235$, $BIC = 1476$) (B) and U model with 6 spline points ($GF = 799$, $BIC = 1080$) (C).