Supplementary Information for manuscript SM-ART-02-2022-000212

Xiangyu Xue, Inge Nys, Kristiaan Neyts, Jeroen Beeckman

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1 Effect of elastic constants

Because the K_{22} twist constant plays a crucial role in the transformation of the splay-bend configuration into regions with twist, simulations have been carried out for fixed K_{11} and K_{33} and different values for K_{22}. Figure S2 shows the LC orientation for $2\Lambda = 4$ μm, and figure S1 for $2\Lambda = 4$ μm. From these images we can see that the elastic energy K_{22} has a significant effect on the tilt angle at the top. When K_{22} is small, the LC can reduce its energy by inducing twist into the sample, which can only happen at the top because the bottom has strong anchoring. When K_{22} becomes larger, approaching K_{11} and/or K_{33}, or becoming larger, the formation of twist inside the layer is inhibited and the structure has mainly splay-bend elastic energy with a small tilt angle at the top.

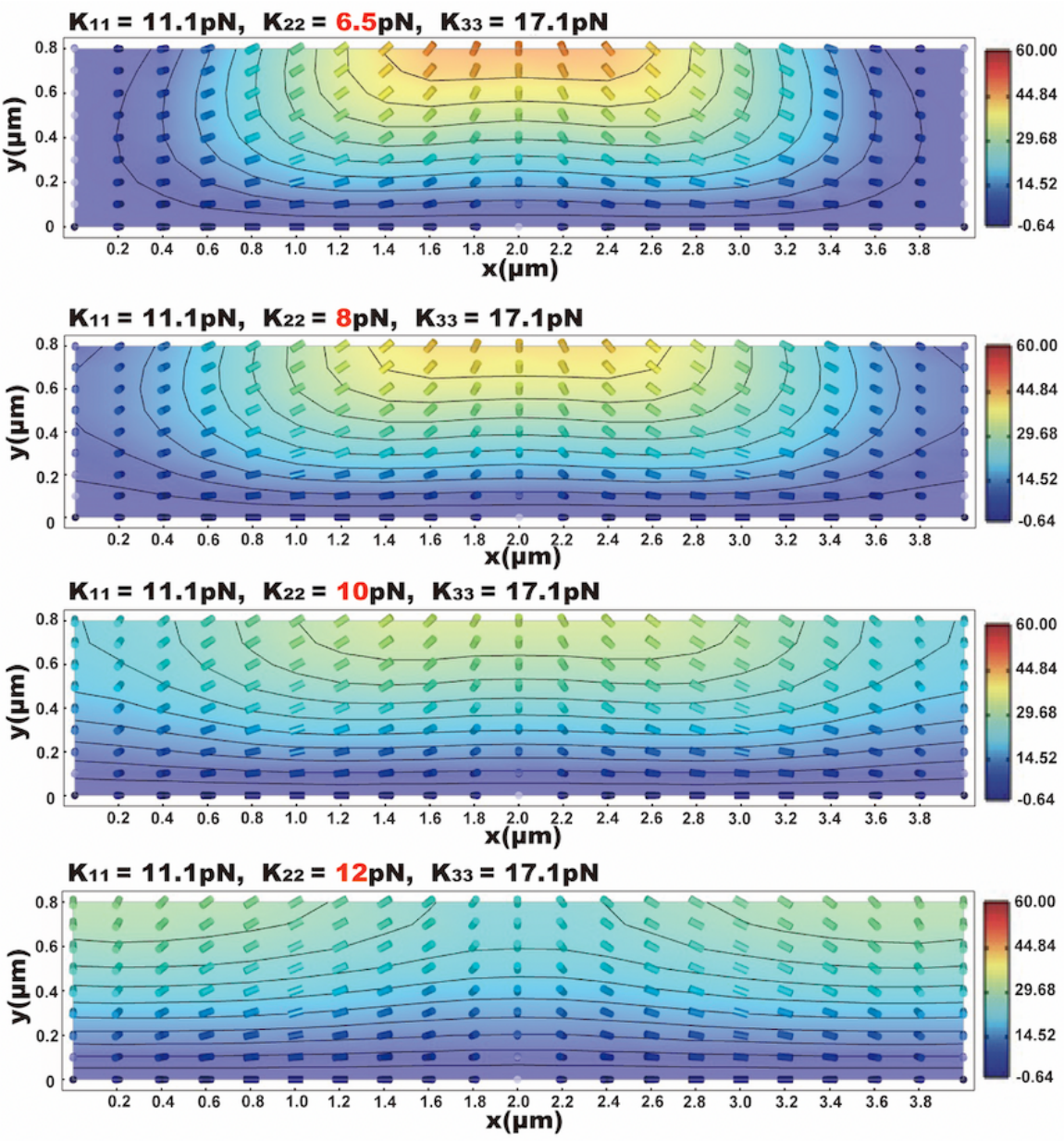

Figure S1: Simulated LC orientation for strong bottom anchoring and $W_{\text{top}} = 1 \times 10^{-5}$ J/m^2 within unit width $2\Lambda = 4$ μm.

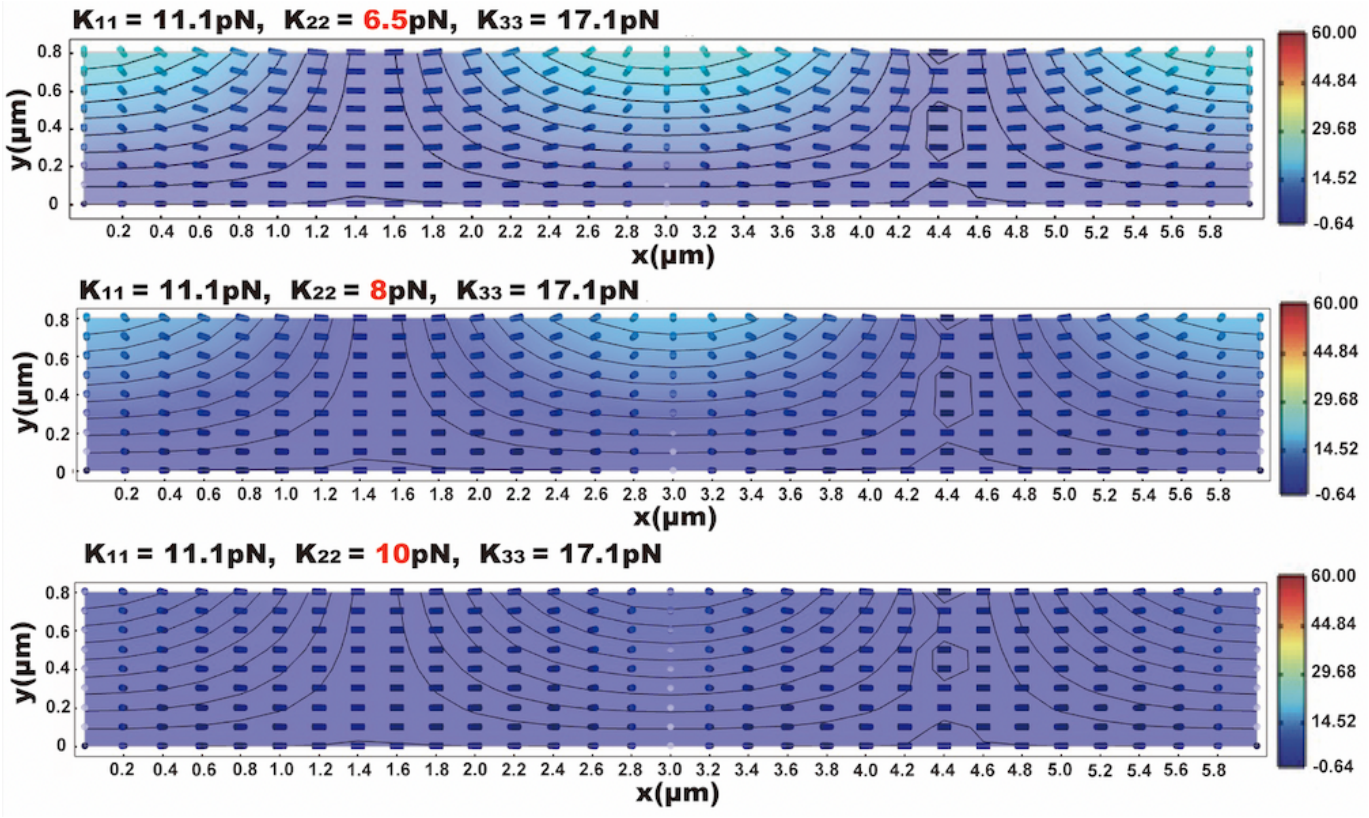

Figure S2: Simulated LC orientation for strong bottom anchoring and $W_{\text{top}} = 1 \times 10^{-5}$ J/m^2 within unit width $2\Lambda = 6$ μm.

2 Effect of smaller periods

Simulations have been carried out to find out if there are any changes in the LC orientation for smaller periods than $2\Lambda = 4$ μm. Simulation results are shown for $2\Lambda = 3$ μm and 2 μm in figure S3. For smaller periods, the symmetry breaking persists, with an effective period of 2Λ. The LC tilt becomes larger and reaches a maximum at the position $x = \Lambda$ of almost 90° for $2\Lambda = 2$ μm. he orientation imposed by the bottom substrate is almost fully erased at the top because of the high tilt angle.

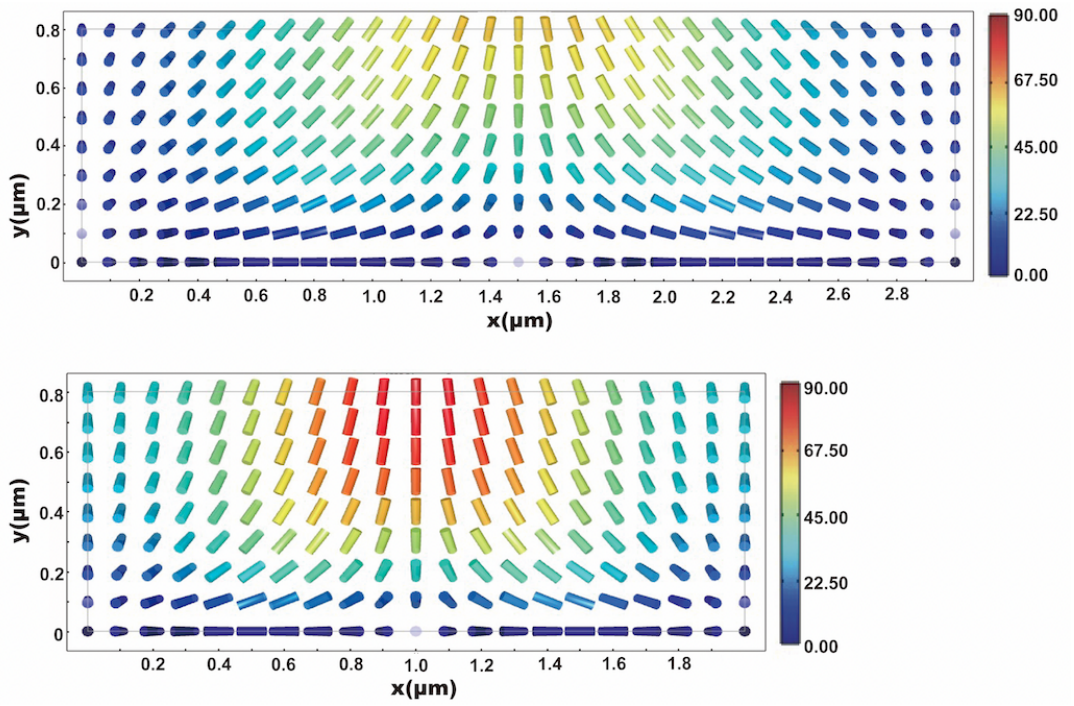

Figure S3: Simulated LC orientation for strong bottom anchoring and $W_{\text{top}} = 1 \times 10^{-5}$ J/m^2 within unit width $2\Lambda = 3$ μm and 2 μm.