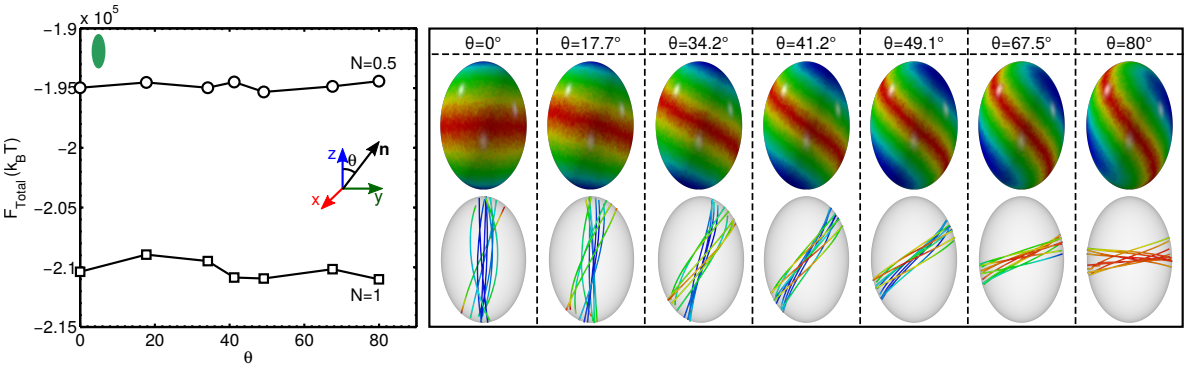

Figure 4.9. Rotated TC on a prolate-shaped geometry. (Left) Total free energy versus inclination of the cholesteric rotation axis for $N = 0.5$ and $N = 1$ on a prolate ($\varphi = 1.5$) with moderate anchoring $W = 1 \times 10^{-4} J/m^2$. (Right) Final configurations of tilted cholesterics at an angle θ respect to the z-axis. The top row shows the orientation of the molecules respect to the surface, red indicates parallel orientation and blue is perpendicular. The bottom row shows streamlines of the director field in the bulk of the prolate.

To close the set of results, we would like to highlight the formation of BPs in different geometries as depicted in figure 4.10. When the geometry is oblate ($\varphi < 1$), the formation of a blue phase is interrupted by the narrowing of the z direction. The symmetry and periodicity of the defect network is truncated so it is not possible to distinguish between a BPII and a BPI. The patterns on the surface form similar structures to those of nanochannels, as 2D skyrmions, opening the possibility for trapping nanoparticles in high energy sites. When $\varphi \to 0.7$ the defects join and form a precursor of a BPII which fully develops in a droplet ($\varphi = 1$). As the geometries are stretched, hybridization of blue phases occur. This is particular to high temperatures ($\tau > 0$) where BPII is stable. In a BPII, all defects eventually merge and form a tetrahedral juncture. For $\varphi > 1$ disclination lines that pass across the bulk and never join others are visible (in light green) which are typical of BPI. As the geometry starts resembling a spindle, more BPI-like disclination lines appear thus obtaining a heavily populated bulk. This should be reflected experimentally in a new coloring of the domains, since there is a smaller cell size in the bulk through which the light would pass.