

Instead, a more complex arrangement including twist is preferred in usual nematic liquid crystals. This is due to the difference in the elastic free energy densities associated with the three types of deformations. The wedge disclination would be stable if  $K_2 \gg K_1$  or  $K_3$ . This is normally not the case for usual nematics, and contrarily, for  $K_2 < K_1$  or  $K_3$ , the director escapes out of the splay–bend distortion plane into the third dimension. In this way the resulting configuration involves twist and consequently decreases the total energy.