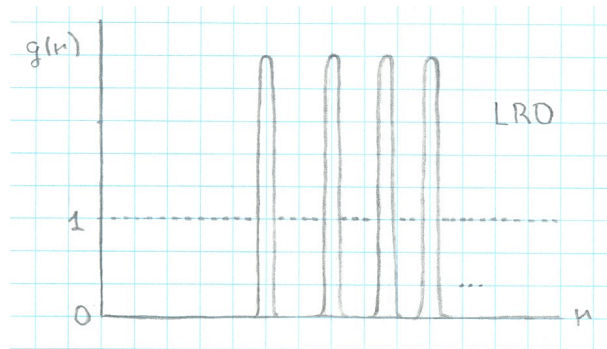


Stages of Positional Ordering [pln82]

The signature quantity here is $g(r)$, the radial distribution function (RDF). It is, in some measure, the probability for finding another mesogen at radius r from any given mesogen.

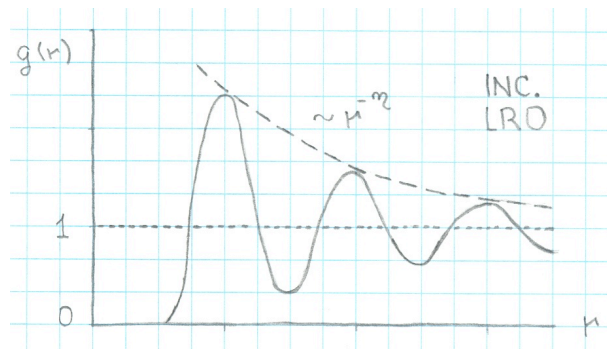
Strong positional ordering:

True long-range order is realized in hard and soft crystal phases including some versions of smectic B. The RDF is strongly peaked at discrete radii that reflect the given lattice structure. Thermal fluctuations cause a mild broadening of the peaks.



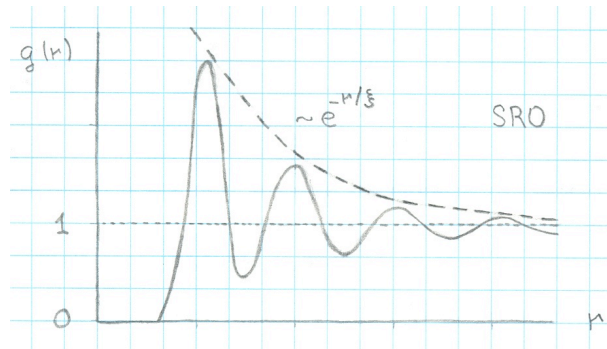
Intermediate positional ordering:

Incipient long-range order is realized across layers of smectic A and smectic C phases. The peaks in the RDF are now significantly broader. The heights of successive peaks decrease with increasing radius according to a power law, $\sim r^{-\eta}$, with a T -dependent exponent η .



Weak positional ordering:

Short-range order is realized in isotropic liquids and nematic liquid crystals. The heights of successive peaks now decrease exponentially with increasing radius, $\sim e^{-r/\xi}$, with a T -dependent correlation length ξ .



[adapted from Hamley 2007]