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# Phonons, Pions and Quasi-Long-Range Order in Spatially Modulated Chiral Condensates

*Tuesday 29 September 2015 16:30 (2 hours)*

We investigate low-energy fluctuations in the real kink crystal phase of dense quark matter within the Nambu–Jona-Lasinio model. The modulated chiral condensate breaks both the translational symmetry and chiral symmetry spontaneously, which leads to the appearance of phonons and pions that are dominant degrees of freedom in the infrared. Using the Ginzburg-Landau expansion near the Lifshitz point, we derive elastic free energies for phonons and pions in dependence on the temperature and chemical potential. We show that the one-dimensional modulation is destroyed by thermal fluctuations of phonons at nonzero temperature, and compute the exponent that characterizes the anisotropic algebraic decay of quasicondensate correlations at long distance. We also estimate finite-volume effects on the stability of the real kink crystal and briefly discuss the possibility of its existence in neutron stars.

## On behalf of collaboration:

NONE

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