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Interferometry in a Moat Regime

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The QCD phase diagram at large chemical potential is largely uncharted territory. Based on model studies, there are various phases that could occur in this regime. Among them are phases related to spatial modulations, such as inhomogeneous/crystalline phases, liquid crystals or a quantum pion liquid. A common feature of all these phases is that particles can have a moat dispersion, where the energy is minimized at nonzero momentum. This can directly affect particle production in heavy-ion collisions and leads to characteristic signatures in particle correlations. I will discuss the underlying physics and present a formalism to study particle spectra on general hypersurfaces in a medium. Using this formalism, I will show that the correlations generated by the Hanbury-Brown-Twiss effect are promising probes for a moat regime in heavy-ion collisions.

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