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Momentum correlations in exciton-polaritons for analogue gravity

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Exciton-polariton fluids are a powerful system for reproducing effects of general relativity and quantum field theory in curved spacetime[1]. Direct detection of spontaneous quantum emission is difficult, and correlations of the field prove to be a powerful tool. Correlations for an acoustic black hole configuration have only been studied in real space[2],[3],[4]. We are interested in correlations in momentum space because they will be easier to detect experimentally. To do so we use the truncated Wigner approximation to compute the observables of the polariton field through statistical averages[5]. The method of these techniques is applicable for studying quantum correlations in many systems of condensed matter.

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