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Exotic pairing in few-body ultracold systems

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A system of a few attractively interacting atoms of lithium in one-dimensional harmonic confinement is investigated. Non-trivial interparticle correlations induced by interactions in a particle-imbalanced system are studied in the framework of the noise correlation. In this way, it is shown that evident signatures of strongly correlated fermionic pairs in the Fulde-Ferrell-Larkin-Ovchinnikov (FFLO) state are present in the system and they can be detected by measurements directly accessible within state-of-the-art techniques. The results convincingly show that the exotic pairing mechanism is a very universal phenomenon and can be captured in systems being essentially non-uniform and far from the many-body limit.

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