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Impurity as a witness of a few- to many-body crossover in low-dimensional degenerate gases

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Impurity atoms or molecules are often used by theorists and experimenters for studying a crossover from few to many-body physics in condensed matter systems, such as superfluid helium and ultracold degenerate gases. The presentation will offer a few examples of such studies in the context of quasi-one- and two-dimensional cold-atom systems with impurities. These examples provide insight into the limiting cases of the Bose polaron and angulon problems, which are characterized by the ‘many-body dressing’ of the impurity. Dependence of this dressing on a number of particles in the bath can be used to quantify a few- to many-body crossover for some ground-state properties of the system.

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