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Hamiltonian for a system of N bosons with regularized zero-range interactions

We discuss a three-dimensional gas of N bosons interacting via a regularized contact interaction only with an impurity of different mass. This regularization is built adopting a proper three-body repulsion. The so-called Minlos-Faddeev extension of the free Hamiltonian that encodes such a regularization has proven to be selfadjoint and bounded from below. The typical Thomas collapse that typically occurs in these three-dimensional bosonic systems is therefore healed with the use of a three-body interaction.