

Abstract Submitted
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Radio-frequency response and contact of impurities in a quantum gas¹ WEIZHE LIU, ZHE-YU SHI, MEERA PARISH, JESPER LEVINSEN, School of Physics and Astronomy, Monash University — We investigate the radio-frequency spectroscopy of impurities interacting with a quantum gas at finite temperature. In the limit of a single impurity, we show that introducing (or injecting) an impurity into the medium is equivalent to ejecting an impurity that is initially interacting with the medium since the “injection” and “ejection” spectral responses are simply related to each other by an exponential function of frequency. Thus, the full spectral information for the quantum impurity is contained in the injection spectral response, which can be determined using a range of theoretical methods, including variational approaches. Our results for the contact of a mobile impurity are in excellent agreement with recent experiments and we find that the finite-temperature behaviour is qualitatively different compared to the case of infinite impurity mass.

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