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Repulsive Fermi Polarons and Their Induced Interactions in Binary Mixtures of Ultracold Atoms GEORGIOS KOUTENTAKIS, SIMEON MISTAKIDIS, GARYFALIA KATSIMIGA, PETER SCHMELCHER, University of Hamburg — We explore repulsive Fermi polarons in one-dimensional harmonically trapped few-body mixtures of ultracold atoms using as a case example a ^{6}Li-^{40}K mixture. A characterization of these quasiparticle-like states, whose appearance is signalled in the impurity's radiofrequency spectrum, is achieved by extracting their lifetime and residua. Increasing the number of ^{40}K impurities leads to the occurrence of both single and multiple polarons that are entangled with their environment. An interaction-dependent broadening of the spectral lines is observed suggesting the presence of induced interactions. We propose the relative distance between the impurities as an adequate measure to detect induced interactions independently of the specifics of the atomic mixture, a result that we showcase by considering also a ^{6}Li-^{173}Yb system. This distance is further shown to probe the generation of entanglement independently of the size of the bath (^{6}Li) and the atomic species. The generation of entanglement and the importance of induced interactions are revealed with an emphasis on the regime of intermediate interaction strengths.

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