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Diagrammatic Monte Carlo study of Fermi-polaron systems PETER KROISS, LODE POLLET, Department of Physics, Arnold Sommerfeld Center for Theoretical Physics and Center for NanoScience, Ludwig-Maximilians-University Munich — We apply the diagrammatic Monte Carlo approach to three-dimensional Fermi-polaron systems with mass-imbalance, where an impurity interacts resonantly with a noninteracting Fermi sea whose atoms have a different mass. This method allows to go beyond frequently used variational techniques by stochastically summing all relevant impurity Feynman diagrams up to a maximum expansion order limited by the sign problem. Polaron energy and quasiparticle residue can be accurately determined over a broad range of impurity masses. The quantitative exactness of two-particle-hole wave-functions is investigated, resulting in a relative lowering of polaronic energies in the mass-imbalance phase diagram. The application of the method to two-dimensional Fermi-polaron systems is presented.

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