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Efficient emulators for three-body scattering using eigenvector continuation[1] XILIN ZHANG, R. J. FURNSTAHL, A. J. GARCIA, P. J. MILLICAN, Ohio State Univ - Columbus — Solving a three-body quantum scattering and reaction problem is known to be computationally expensive. As a result, the computing time becomes a bottleneck issue for exploring a three-body model's parameter space. On the other hand, such exploration, i.e., repeatedly solving a three-body problem with different theory parameters, is needed in various data analysis, such as fitting nucleon interactions to deuteron-nucleon scattering and reaction data, as well as extracting nuclear structure information from deuteron-nucleus scattering and reaction measurements. In this talk, I will discuss our recent development of emulators—surrogate models that can be solved efficiently—for three-body scattering. It is an extension of our previous work (arXiv: 2007.03635) on two-body-scattering emulators, based on so-called eigenvector continuation. I will demonstrate the efficiency and accuracy of these emulators. In the end, I will briefly discuss the broad applications of these emulators.

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