Coupled-channel systems in a finite volume ZOHREH DAVOUDI, University of Washington — In this talk I will motivate studies of two-body coupled-channel systems in a finite volume in connection with the ultimate goal of studying nuclear reactions, as well as hadronic resonances, directly from lattice QCD. I will discuss how one can determine phase shifts and mixing parameters of coupled-channels such as that of pipi-KK isosinglet system from the energy spectrum in a finite volume with periodic boundary conditions. From the energy quantization condition, the volume dependence of electroweak matrix elements of two-hadron processes can also be extracted. This is necessary for studying weak processes that mix isosinglet-isotriplet two-nucleon states, e.g. proton-proton fusion. I will show how one can obtain such transition amplitudes from lattice QCD using the formalism developed.

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