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Systematic assignment of Feshbach resonances via an asymptotic bound state model MAIKEL GOOSEN, SERVAAS KOKKELMANS, Eindhoven University of Technology — We present an Asymptotic Bound state Model (ABM), which is useful to predict Feshbach resonances. The model utilizes asymptotic properties of the interaction potentials to represent coupled molecular wavefunctions. The bound states of this system give rise to Feshbach resonances, localized at the magnetic fields of intersection of these bound states with the scattering threshold. This model was very successful to assign measured Feshbach resonances in an ultra cold mixture of ^{6}Li and ^{40}K atoms[1]. For this system, the accuracy of the determined scattering lengths is comparable to full coupled channels results. However, it was not possible to predict the width of the resonances. We discuss how an incorporation of threshold effects will improve the model, and we apply it to a mixture of ^{87}Rb and ^{133}Cs atoms, where recently Feshbach resonances have been measured.

[1]E. Wille, F.M. Spiegelhalder, G. Kerner, D. Naik, A. Trenkwalder, G. Hendl, F. Schreck, R. Grimm, T.G. Tiecke, J.T.M. Walraven, S.J.J.M.F. Kokkelmans, E. Tiesinga, P.S. Julienne, arXiv:0711.2916

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