Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Feshbach resonances in the ultracold 6Li-173Yb mixtures[1] HUI LI, MING LI, SVETLANA KOTOCHIGOVA, Department of Physics, Temple University — The LiYb molecule is of current experimental interest due to its spin doublet ground state with both electric and magnetic dipole moments. Here, we develop a theoretical model to predict the location and width of Feshbach resonances in ^{6}Li-^{173}Yb mixtures at ultracold temperatures by taking into account R-dependent hyperfine couplings. By using the non-relativistic configuration-interaction valance-bond (CI-VB) method, we, first, compute the hyperfine coupling constants as functions of internuclear separation. The short-range modification of the hyperfine couplings leads to narrow Feshbach resonances. Then we present quantum scattering calculations using the state-of-art *ab initio* $^2\Sigma^+$ molecular potential, which has been adjusted to reproduce spectroscopic bound-state measurements. The calculated resonance widths, although small, are comparable to some of the successfully observed resonances in RbSr [1]. Finally, we describe the properties of the predicted ^{6}Li^{173}Yb Feshbach resonances, offering a guide for current experimental measurements. [1] B. Vincent, C. Alessio, P. Benjamin, R. Lukas, S. Florian, P. S. Żuchowski and J. M. Hutson, Nature Phys. **14**, 881 (2018).

[1]This work is supported by AFOSR Grant No. FA9550-14-1-0321 and ARO Grant No. W911NF-17-1-0563.

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Date submitted: 27 Jan 2019 Electronic form version 1.4