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Effects of Electric Fields on Heteronuclear Feshbach Resonances in Ultracold ^{6}Li $-^{87}$Rb Mixtures[1] K.W. MADISON, Z. LI, University of British Columbia — Magnetic Feshbach resonances (FRs) provide a powerful tool to control microscopic interactions in ultracold atomic gases. Recent theoretical work has demonstrated the possibility of inducing FRs in heteronuclear atomic mixtures by applying a static electric field. The mechanism is based on the interaction of the instantaneous dipole moment of the collision complex with the external electric field. Recently, we have generated accurate singlet and triplet interaction potentials for ultracold collisions in ^{6}Li–^{87}Rb mixtures based experimental measurements. We use these potentials to investigate the effects of external electric fields on elastic collisions in ultracold Li–Rb mixtures. We report on a number of fascinating phenomena including the observation that the electric field induces a coupling which breaks the degeneracy of states with non-zero angular momentum producing multiple FRs. Recently it was observed that magnetic dipole-dipole interactions can produce a similar effect, splitting a p-wave Feshbach resonance into a doublet corresponding to the magnitude of the projection of the orbital angular momentum onto the field axis. The major difference here is that the splitting is continuously tunable using an applied electric field and more than an order of magnitude larger.

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