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Semi-classical study of cold inelastic dipole-dipole collisions CATHERINE NEWELL, MICHAEL CAVAGNERO, VLADIMIR ROUDNEV, University of Kentucky — Inelastic collision cross-sections for polar molecules in static electric fields are calculated semi-classically. The molecules are modeled as polar rigid-rotors in low-field seeking states. Our analysis treats two-body collisions between such low-field seeking dipoles at various temperatures in the cold and ultracold regimes, and is applicable to several molecular species. We examine in detail partial cross-sections for the production of high-field seeking states, and the dependence of these cross-sections on the angle of incidence with respect to the external field direction. The degree to which rotationally inelastic collisions are impulsive, as opposed to perturbative, is assessed.

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