

Abstract Submitted  
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**Rotation of a generalized Eckart frame in atom-diatom molecule scattering**<sup>1</sup> FLORENCE J. LIN, University of Southern California — A cyclic change in the shape of an atom-diatom molecule complex can lead to net rotation of not only the complex, but also the rotating axes of a generalized Eckart frame of the complex. Large-amplitude, “internal” motions of an atom-diatom molecule van der Waals complex can lead to overall rotation of the complex in the center-of-mass frame. When the total angular momentum is conserved, the net angle of overall rotation is the sum of a dynamic phase plus a geometric phase. The classical geometric phase is describable in terms of molecular rotational constants. The scattering angle of the atom in a nonreactive “slightly sticky collision” between an atom and a diatomic molecule in molecular beams depends on an analogous “internal” motion. Thus, the scattering angle of the atom is also given by the sum of a dynamic phase plus a geometric phase.

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