Abstract Submitted
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Study of the effect of collisions on the rotational angular momentum of diatomic molecules with polarized light[1] PHILLIP ARNDT, CHARLES PACKARD, VY TRAN, JOSHUA CAREY, REBECCA LIVINGSTON, Temple University, JOHN HUENNEKENS, Lehigh University, MARJATTA LYYRA, ERGIN AHMED, Temple University — Understanding the underlying mechanisms of collisional processes between atoms and molecules is of fundamental importance for a large number of areas of research, including chemical reactivity, ultracold atoms and molecules, and astrophysics of the interstellar medium. In general, molecules are not spherically symmetric objects and as a result most collisional processes involving them strongly depend on the relative alignment of the colliding partners. We have studied experimentally the changes in the alignment of the rotational angular momentum of diatomic molecules during elastic and inelastic collisions. In the experiment we use a system consisting of diatomic lithium molecules colliding with noble gas atoms (helium and argon) in a thermal gas phase sample. The collisions are studied in the first excited $A^1\Sigma_u^+$ state using combination of polarized laser light and fluorescence to selectively excite and detect the molecules in specific rotational sublevels.

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