

Abstract Submitted
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Spinning Molecules to Well-Defined J-States¹ HANNAH M. OGDEN, TARA J. MICHAEL, MATTHEW J. MURRAY, AMY S. MULLIN, Univ of Maryland-College Park — The optical centrifuge is a laser based technique to trap and spin molecules to high J states. The rotational energy of the centrifuged molecules depends on the spectral bandwidth of the centrifuge laser and the molecules moment of inertia. This study investigates how controlling the spectral bandwidth of the centrifuge laser affects the initial distribution of centrifuged molecules. High resolution transient IR absorption spectroscopy is used to interrogate the initial distributions of N₂O, CO₂, and CO super rotor molecules. States populated directly in the centrifuge are expected to show prompt appearance relative to collision induced populations. Furthermore, line profiles of nascent centrifuged molecules will not have collision induced Doppler broadening. Line center transient absorption signals yield information about the time dependent appearance of initially populated J states. These studies provide information about the capture and acceleration efficiency of the optical centrifuge.

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