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Progress towards large, dense samples of laser-cooled molecules[1]
JAMIE SHAW, JOSEPH SCHNAUBELT, DANIEL MCCARRON, Univ of Connecticut - Storrs — The extension of laser cooling and trapping techniques to molecules promises access to new research directions from quantum simulation to improved precision measurements. To date, inefficient trap loading has been a key barrier preventing the production of large, dense samples of ultracold molecules using molecular magneto-optical traps (MOTs). Our experiment aims to remove this barrier by producing brighter beams of cold molecules and by working with species with closed electronic shells in $^1\Sigma^+$ ground states. These molecules have favorable properties for laser cooling including a lack of spin-rotation structure and the presence of strong optical transitions for efficient trap loading. We will present an update on experimental progress including the conditions required to produce quasi-continuous beams of cold and slow molecules, a background-free fluorescence imaging scheme and a new laser system projected to produce ˜1 W at 261.5 nm.

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