

Abstract Submitted
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Prospects for aligning ultra-cold molecules via magnetic sublevel dependent ac Stark effect JIANBING QI, Pennsylvania State University — We study the population dynamics of a three-level molecular system coupled by two lasers using density matrix equations. In a molecular transition, the coupling laser induced ac Stark effect influences the magnetic sublevel differently and the transition line strength depends on the angular momentum of the molecular states as well as the photon's polarization. The individual magnetic sublevel population can be controlled by the amplitude and detuning of the coupling laser. This provides a spectroscopic means of isolating individual magnetic sublevel and thereby of producing aligned or even oriented molecules. We propose an experimental scheme to observe this effect in an ultra-cold molecule system.

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