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Benchmarking a stimulated force for molecular beams with Rb atoms[1] SCARLETT YU, XUEPING LONG, UCLA, ANDREW JAYICH, UCSB, WESLEY C. CAMPBELL, UCLA — The rich internal structures of molecules make ultracold molecules attractive candidates for sensitive probe of fundamental physics, but for the same reason they are hard to decelerate, cool and trap, as the many possible spontaneous emission paths limit the ability to optically decelerate molecules to trappable speed. We demonstrate a stimulated force solution to this problem using pulses generated from a mode-locked laser. A molecular beam can be first excited by a counter-propagating "pump" pulse, then driven back to the initial ground state by a co-propagating "dump" pulse via stimulated emission. The delay between the pump and dump pulse is set to be shorter than the excited state lifetimes in order to limit decays to dark states. We report results of our benchmarking this stimulated force by accelerating a cold sample of neutral Rb atoms.

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