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Feshbach-stimulated Raman photoproduction of a Bose-Einstein condensate of singlet molecules MATTHEW FENTY, Temple Univeristy, DANIELLE SAVAGE, MATT MACKIE, Temple University — We theoretically examine the formation of a quantum degenerate gas of stable singlet molecules via Feshbach-stimulated Raman photoproduction, or free-bound-bound-bound-bound transitions from an atomic to a singlet molecular Bose-Einstein condensate. In particular, a magnetic field tuned near a Feshbach resonance initiates collective conversion from an atomic condensate to a triplet molecular condensate, which is then converted by three-laser stimulated Raman adiabatic passage (STIRAP) to a stable singlet molecular condensate. Although population of the target singlet state is near-unit efficient, the population of an intermediate state is significant ($\sim 10^{-3}$), and large bound-bound Rabi couplings (~ 10 GHz) are required to avoid losses.

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