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**Conversion efficiency of heteronuclear Feshbach molecules**

SHOHEI WATABE, the University of Tokyo, JAMES E. WILLIAMS, Wolfram Research, Inc., TETSURO NIKUNI, Tokyo University of Science — We study formations of heteronuclear Feshbach molecule in population imbalanced atomic gases, extending the recent work [J. E. Williams et. al., New J. Phys. 8, 150 (2006)] on the Feshbach molecule formation. We find that conversion efficiency depends on a ratio of the number of atomic species in the initial state before the magnetic sweep, as well as an initial temperature and an initial peak phase space density. At low temperature in quantum degenerate regime, quantum statistics of atoms plays an important role in conversion efficiencies. Maximum conversion efficiencies are determined by quantum statistics and the number ratio. When the major component is bosonic, the maximum conversion efficiency is 50%. On the other hand, when the major component is fermionic and the minor component is bosonic, the maximum conversion efficiency has a range from 50% to 100%, which is determined by the initial atomic ratio. In the case that both components are fermionic, the maximum conversion efficiency is 100%. In the region where the gases does not condense, the conversion efficiency is described as a function of initial peak phase space density of a major component.

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