

Abstract Submitted
for the OSS15 Meeting of
The American Physical Society

Two-axis spin squeezing of two-component BEC via a continuous driving¹ HUANG WEN, University of Science and Technology of China — In two-component BEC, the one-axis twisting Hamiltonian leads to spin squeezing with the limitation that scales with the number of atoms as $N^{-\frac{2}{3}}$. We propose a scheme to transform the one-axis twisting Hamiltonian into a two-axis twisting Hamiltonian, resulting in enhanced spin squeezing $\propto N^{-1}$ approaching the Heisenberg limit. Instead of pulse sequences, only one continuous driving field is required to realize such transforming, thus the scheme is promising for experiment realizations, to an one-axis twisting Hamiltonian. Quantum information processing and quantum metrology may benefit from this method in the future. Besides, our scheme is spin number independent and needs a shorter evolution time compared with [1].

[1] C. Shen and L. M. Duan, Phys. Rev. A **87**, 051801 (2013).

¹This work was supported by National Fundamental Research Program, National Natural Science Foundation of China (No. 11274295, 2011cba00200) and Doctor Foundation of Education Ministry of China (No. 20113402110059).

Huang Wen
University of Science and Technology of China

Date submitted: 20 Jan 2015

Electronic form version 1.4