Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Development of a compact cold atom clock with a cylindrical cavity LIANG LIU, HUADONG CHENG, PENG LIU, YANLING MENG, JINYIN WAN, XIUMEI WANG, YANNING WANG, LING XIAO, Shanghai Institute of Optics and Fine Mechanics, CAS — The development of a compact cold atom clock with an integrating sphere is described. Rubidium atoms are cooled by diffuse light generated by injecting lasers into a cylinder with high diffuse reflection of light at the inner surface. We measured the number, temperature, distribution, and lifetime of cold atoms in the cylinder. A special method to control the cold atom distribution in the cylinder is developed in order to improve the signal to noise ratio of the cold atom clock. The cylinder is also used as a microwave cavity with TE011 [1], which is designed and manufactured for a cold rubidium atom clock. We will report the recent progress on the newly-designed cold atom clock. In this design, the polarization detection rather than absorption detection [2] is used to detect the cold atoms, by which the contrast of the signal is greatly increased.

[1] Meng, Y.L. *et al.*, Phys. Lett. A 378, 2034 (2014)
[2] Zheng, B.C. *et al.*, Chin. Phys. Lett. 31, 073701 (2014)

Liang Liu
Shanghai Institute of Optics and Fine Mechanics, CAS

Date submitted: 30 Jan 2015 Electronic form version 1.4