Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Doubly-resonant electromagnetically induced transparency in a Fabry-Perot cavity XIN-XIN HU, CHANG-LING ZHAO, ZHU-BO WANG, YAN-LEI ZHANG, XU-BO ZOU, CHUN-HUA DONG, GUANG-CAN GUO, CHANG-LING ZOU, University of Science and Technology of China — The optical resonator can enhance the light-matter interactions. We present an experimental study on the cavity-atom ensemble system, and realized the doubly-resonant enhanced electromagnetically induced transparency where both the probe and control lasers are on-resonance with the cavity. We demonstrate two approaches to realize the doubly-resonant condition, by controlling the temperature of the atom vapor cell, or by precisely tuning the cavity length. In such a system, the control power can be reduced due to the cavity enhancement, and we show all-optical switching with reduced control laser power compared to previous studies. Such doubly-resonant system can be used for various applications, such as optical signal storage and microwave-to-optical frequency conversion.

Chang-Ling Zou
University of Science and Technology of China

Date submitted: 06 Feb 2018 Electronic form version 1.4