Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Three-photon coherence of Rydberg atomic states HYO MIN KWAK, TAEK JEONG, YOON-SEOK LEE, HAN SEB MOON, Pusan Natl Univ — We investigated three-photon coherence effects of the Rydberg state in a four-level ladder-type atomic system for the $5S_{1/2}$ (F=3) – $5P_{3/2}$ (F'=4) – $50D_{5/2}$ – $51P_{3/2}$ transition of ^{85}Rb atoms. By adding a resonant electric field of microwave (MW) at electromagnetically induced transparency (EIT) in Rydberg state scheme, we observed experimentally that splitting of EIT signal appears under the condition of three-photon resonance in the Doppler-broadened atomic system. Discriminating the two- and three-photon coherence terms from the calculated spectrum in a simple four-level ladder-type Doppler-broadened atomic system, we found that the physical origin of splitting of EIT was three-photon coherence effect, but not three-photon quantum interference phenomena such as three-photon electromagnetically induced absorption (TPEIA).

Hyo Min Kwak
Pusan Natl Univ

Date submitted: 03 Feb 2016 Electronic form version 1.4