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**Velocity selective optical pumping effects in electromagnetically induced absorption for  $^{85}\text{Rb}$  atoms: polarization dependences<sup>1</sup>**  
HEUNG-RYOUL NOH, HA-EUN HONG, Chonnam National University, ZEE-SHAN JADOON, JIN-TAE KIM, Chosun University — We present experimental and theoretical studies on velocity selective optical pumping effects on electromagnetically induced absorption for the  $F_g = 3 \rightarrow F_e = 2, 3$ , and 4 transitions of  $^{85}\text{Rb}$  atoms. Probe transmittance spectra are investigated by scanning the coupling laser frequency from the  $F_g = 3 \rightarrow F_e = 2, 3$ , and 4 transitions with a weak probe laser resonant to the  $F_g = 3 \rightarrow F_e = 4$  transition of  $^{85}\text{Rb}$  atoms. We consider laser linewidth, atomic thermal velocity distributions, frequency mixings of coupling and probe beams due to degenerate magnetic sublevels, and various polarization configurations of the coupling beam with a probe beam fixed at  $\sigma^+$  polarization in the simulation of the spectra. We find good agreement between the calculated and observed transmittance spectra for each coupling laser polarization configuration.

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