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Ladder-type Electromagnetically Induced Transparency with Optical Pumping Effect ZONG-SYUN HE, CHIN-CHUN TSAI, JYH-HUNG TSAI, YUNG-YUNG CHANG, CHI-CHUAN LIAO, Department of Physics at National Chen Kung University — This study thoroughly elucidated the relative intensities of the probe transmission in a ladder-type electromagnetically induced transparency (EIT) system by considering the optical pumping effect. The observed EIT spectra reveal a different probe or coupling power dependence for various transmission peaks. In addition to causing quantum interference, the probe and coupling laser fields realign the population of Zeeman sub-levels in the ground state through optical pumping. Analytical results indicate that the re-distribution levels failing to contribute to the EIT peaks, either out of transition path or zero transition probability, will significantly affect the transmission intensity.

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