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**Resonant two-photon absorption and electromagnetically induced transparency in open ladder-type atomic system**[1] HAN SEB MOON, Pusan National University, HEUNG-RYOUL NOH, Chonnam National University — We have experimentally and theoretically studied resonant two-photon absorption (TPA) and electromagnetically induced transparency (EIT) in the open ladder-type atomic system of the $5S_{1/2}$(F = 1)-$5P_{3/2}$(F' = 0, 1, 2)-$5D_{5/2}$(F" = 1, 2, 3) transitions in $^{87}$Rb atoms. As the coupling laser intensity was increased, the resonant TPA was transformed to EIT for the $5S_{1/2}$(F = 1)-$5P_{3/2}$(F' = 2)-$5D_{5/2}$(F" = 3) transition. We demonstrate the influence of the atomic system openness and the multi-photon interaction on the resonant TPA and EIT in the three-level ladder-type atomic system. From the numerical results, considering all the degenerate magnetic sublevels of the $5S_{1/2}$-$5P_{3/2}$-$5D_{5/2}$ transition, both the competing EIT and TPA phenomenon could be understood by the decomposition of the spectrum into an EIT component owing to the pure two-photon coherence and a TPA component caused by the mixed term

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