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**Analytical calculation of susceptibility for Doppler-broadened two-level atoms in pump-probe spectroscopy** SEUNG CHUL YANG, HYUN-JONG KANG, HEUNG-RYOUL NOH, Chonnam Natl Univ — An analytical study of susceptibility in pump-probe laser spectroscopy for an atomic medium composed of two-level atoms in the Doppler limit is presented. We derive an accurate analytical formula for susceptibility up to the first order at the Rabi frequency of the probe beam while the intensity of the pump beam is arbitrary. The analytical form of the susceptibility is expressed in a succinct single term rather than as a complicated summation, as presented in previous papers. We also derive analytical solutions for the linewidth and peak value of the absorption spectrum of the probe beam.

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