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Optical characterization of p-doped InP epitaxial layers in mid and far infrared region¹ R.C. JAYASINGHE, Y.F. LAO, A.G.U. PERERA, Georgia State University, M. HAMMAR, Royal Institute of Technology, Kista, Sweden, C.F. CAO, Chinese Academy of Sciences, Shanghai, China, H. WU, Zhejiang University, Hangzhou, China — The optical properties of p-doped Indium Phosphide (InP) epitaxial thin films with 1, 3, and $24 \times 10^{18} \text{ cm}^{-3}$ carrier concentrations were investigated by infrared reflection, transmission, and absorption measurements in 5 - 40 μm wavelength range. The absorption spectra were modeled by complex dielectric function using the classical Lorentz–Drude model. The phonon absorption in InP was modeled using eight Lorentzian oscillators. This method gives a straightforward approach for modeling the experimental absorption spectra when compared to the two-phonon absorption spectroscopy technique. The calculated spectra are in a good agreement with experimental spectra. The effects of doping on fitting parameters are also investigated.

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R. C. Jayasinghe
Georgia State University

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