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Temperature dependence of the A, B, and C excitons in ZnO over 5-400 K: A modulated reflectivity study. S. TSOI, Purdue U., M. CARDONA, MPIFKF, Germany, R. LAUCK, MPIFKF, Germany, H. ALAWADHI, U. of Sharjah, UAE, X. LU, Purdue U., M. GRIMSDITCH, Argonne National Laboratory, A. K. RAMDAS, Purdue U. — Optical properties of ZnO, a wide gap semiconductor with wurtzite structure, have generated renewed interest in the material in the context of opto-electronic phenomena and applications. The A, B, and C excitons of ZnO, arising from the combined effects of crystal field and spin-orbit splittings of the valence band, are investigated in the temperature range 5- 400 K, exploiting electro-, photo-, and wavelength-modulated reflectivity. The specimens studied have natural isotopic composition. The temperature dependence of the A, B, and C excitonic band gaps, fitted with a two harmonic oscillator model[1] following Manjón *et al.*[2], yields the magnitudes of the zero-point renormalizations 262 meV (A), 227 meV (B), and 249 meV (C), respectively. Isotopically controlled ZnO is currently being investigated to determine the isotopic mass dependence of the zero-point renormalizations.

[1]M. Cardona, Phys. Status. Solidi b **220**, 5 (2000); R. Pässler, J. Appl. Phys. **89**, 6235 (2001)
[2]F. J. Manjón *et al.*, Solid State Commun. **128**, 35 (2003)

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