Comment on "Photoreflectance study in the E_1 and $E_1+\Delta_1$ transition regions of CdTe" [J. Appl. Phys. 87, 7360 (2000)]

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Kaneta and Adachi[1] have recently presented a photoreflectance (PR) study of CdTe in the region of the "E_1" and "$E_1+\Delta_1$" transitions as a function of temperature in the range of 77–300 K. As is acknowledged in the article these optical features are primarily excitonic in nature; the PR line shape fits are relevant to excitonic features, i.e., the exponent n_j in Eq. (6) is taken to be 2.

The fact that the E_1 and $E_1+\Delta_1$ optical transitions in diamond and zincblende semiconductors are mainly excitonic has been known for more than 30 years.[2] Therefore, as pointed out in Ref. 3 (an article that has been largely ignored) the energies of these features are not the critical point (CP) energies, as discussed in Ref. 1 and listed in Table I. These structures actually correspond to the CP energies minus the binding energy (R_1) of the related two-dimensional exciton, i.e., E_1-R_1 and $(E_1+\Delta_1)-R_1$. Reference 3 and the work of Wei *et al.*[4] have shown that R_1 in CdTe is quite substantial, i.e., about 150 meV.

As pointed out in a number of recent articles by the Brooklyn College group[4–9] the so-called E_1 and $E_1+\Delta_1$ optical transitions in these materials should actually be labeled E_1-R_1 and $(E_1+\Delta_1)-R_1$, respectively.

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