Erratum: Theory of the temperature dependence of the direct gap of germanium [Phys. Rev. B 23, 1495 (1981)]

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The temperature coefficient of the direct absorption edge was split into Debye-Waller and self-energy terms. We have found a numerical error in the calculation of the self-energy terms, arising from an inconsistency in labeling the two atoms per cell between band structure and lattice dynamics used in our work. This error has the effect of changing a plus sign to a minus sign in the expression for $(\partial E_{\vec{k}n}/\partial n_{\vec{Q}j})_{SE}$ given in Eq. (16). This error has little influence on the temperature dependence of the $\Gamma_{2'}$ (conduction band) state shown in Fig. 5, but drastically reduces the effect of TA phonons on the $\Gamma_{25'}$ (valence band) state shown in Fig. 6. As a result, the self-energy contribution to the temperature coefficient of the gap reverses sign. The total temperature coefficient is thus less than the Debye-Waller contribution and in better agreement with experiment than was shown in Fig. 8. The revised version of Fig. 8 is given below. Revised versions of Tables I–IV (which are partially in conflict with electron-phonon selection rules) are planned to be given in a subsequent publication. We thank Professor U. Rössler for pointing out the problem of the selection rules to us.

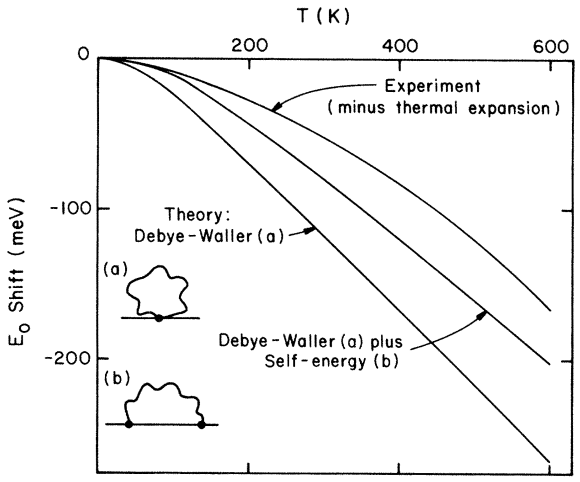

FIG. 8. Revised version, showing theoretical and experimental shift with temperature of the E_0 gap in Ge.