where the partition function Z must also be expanded in a power series in δ,

$$\frac{1}{Z}=\frac{1}{Z_0}[1+\delta\beta\langle\mathcal{H}_a\rangle_0+O(\delta^2)],$$

where $\langle O\rangle_0$ is the expectation value of the operator O evaluated in a system described by the Hamiltonian $\mathcal{H}_0$ and $Z_0=\mathrm{Tr}e^{-\beta\mathcal{H}_0}$. The exact cancellation of the term $+\delta\beta\langle\mathcal{H}_a\rangle_0$ in the expansion of $1/Z$ and the second term of Eq. (A2) is equivalent to the summation of all disconnected diagrams. In terms of the expectation values of operators evaluated in the harmonic approximation,

$$\langle Q(\mathbf{k}j)\rangle=\frac{\mathbf{E}_0\cdot\mathbf{M}_1}{\omega^2(01)}\delta_{\mathbf{k},0}\delta_{j,1}-\delta\beta\left\langle\mathcal{H}_a\int_0^1 e^{-\beta\mathcal{H}_0 s}Q(\mathbf{k}j)e^{\beta\mathcal{H}_0 s}ds\right\rangle_0+O(\delta^2)$$

$$=\frac{\mathbf{E}_0\cdot\mathbf{M}_1}{\omega^2(01)}\delta_{\mathbf{k},0}\delta_{j,1}-\frac{\delta\sinh[\beta\hbar\omega(\mathbf{k}j)]\langle\mathcal{H}_aQ(\mathbf{k}j)\rangle_0}{\hbar\omega(\mathbf{k}j)}+\frac{\delta i2\sinh^2[\beta\hbar\omega(\mathbf{k}j)/2]\langle\mathcal{H}_aP(-\mathbf{k}j)\rangle_0}{\hbar\omega^2(\mathbf{k}j)}.$$

Finally, one obtains

$$\langle Q(\mathbf{k}j)\rangle=\delta_{\mathbf{k},0}\delta_{j,1}\frac{\mathbf{E}_0\cdot\mathbf{M}_1}{\omega^2(01)}+\frac{2\mathbf{E}_0\cdot\mathbf{M}_2(01,01)\mathbf{E}_0\cdot\mathbf{M}_1\delta_{\mathbf{k},0}\delta_{j,1}}{\omega^4(01)}-\frac{3\phi_3(01,01,-\mathbf{k}j)(\mathbf{E}_0\cdot\mathbf{M}_1)^2}{\omega^2(\mathbf{k}j)\omega^4(01)}$$
$$-\sum_{\mathbf{k}'j'}\frac{\phi_3(\mathbf{k}'j',-\mathbf{k}'j',-\mathbf{k}j)3\hbar}{\omega(\mathbf{k}'j')\omega^2(\mathbf{k}j)}[n(\mathbf{k}'j')+\tfrac{1}{2}].$$

All other expectation values are needed only in lowest order and are given by

$$\langle Q(\mathbf{k}j)P(\mathbf{k}'j')\rangle=\tfrac{1}{2}i\hbar\delta_{\mathbf{k},\mathbf{k}'}\delta_{j,j'}+O(\delta),$$
$$\langle Q(\mathbf{k}j)Q(\mathbf{k}'j')\rangle=[\hbar/\omega(\mathbf{k}j)]\delta_{\mathbf{k},-\mathbf{k}'}\delta_{j,j'}[n(\mathbf{k}j)+\tfrac{1}{2}]+\delta_{\mathbf{k},0}\delta_{j,1}\delta_{\mathbf{k}',0}\delta_{j',1}(\mathbf{E}_0\cdot\mathbf{M}_1)^2/\omega^4(01)+O(\delta).$$

Errata

Optical Dispersion of Lead Sulfide in the Infrared, J. R. Dixon and H. R. Riedl [Phys. Rev. **140**, A1283 (1965)]. Last two sentences of the abstract should read: Calculations based on the band parameters given by Duff, Ellett, and Kuglin show that nonparabolicity of the conduction band accounts for a large part of the observed change of effective mass with carrier density. The reflection spectrum associated with lattice vibrations is shown to be satisfactorily represented by a single classical lattice oscillator having values of the longitudinal and transverse optical-mode frequencies in agreement with those obtained by other workers.

Accurate Numerical Method for Calculating Frequency Distribution Functions in Solids, G. Gilat and L. J. Raubenheimer [Phys. Rev. **144**, 390 (1966)]. The factor $(2b^2)$ in the first term of Eq. (16) should be replaced by b^2. Results reported in this paper were obtained using the correct expression.