

and  $\exp[4\langle\kappa^2 X^2\rangle_T] = 1.00039$ . That is, the pseudo-Debye-Waller factor provides a negligible correction at 30°K for tungsten, and the effect of virtual phonon processes accompanying a net emission or absorption of one phonon cannot account for the deviation of theoretical values for  $\alpha$  from experimental values at low temperatures.

Indeed, one could see physically that  $\langle\kappa^2 X^2\rangle_T$  must be small compared to unity without the laborious terms of

Eq. (8). For  $\kappa X$  is of the order of the vibrational displacement of an atom divided by the interatomic distance, and this must be small if the lattice vibrations theory, which after all is a small oscillations theory, is to hold.

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## Errata

**Quantitative Determination of Sources of the Electro-optic Effect in LiNbO<sub>3</sub> and LiTaO<sub>3</sub>**, I. P. KAMINOW AND W. D. JOHNSTON, JR. [Phys. Rev. **160**, 519 (1967)]. A factor-of-2 error in Eq. (1) has been called to our attention by R. Loudon. It should read

$$S_{ij,k}^m = \left( \frac{\hbar\omega_m\omega_s^4(n_0^m+1)n_s l d \Omega}{32\pi^3\epsilon_0^2 c^4 n_p} \right) \left( \frac{v|\alpha_{ij,k}^m|^2}{K_k^m} \right), \quad (1)$$

where we now distinguish  $n_s$  and  $n_p$ , the refractive indices at  $\omega_s$  and  $(\omega_s + \omega_m)$ . Despite the reduction in  $\alpha_{ij,k}^m$  by  $2^{-1/2}$ , the correlations between electro-optic coefficients and Raman measurements can still be satisfied within experimental accuracy by suitable choices of the arbitrary signs in Eq. (4). For example,

$$\begin{aligned} r_{33} &= 23.5\{1 - 0.12 - 0.02 + 0.24\} + 7.5 = 33, \\ r_{13} &= 6.6\{1 - 0.25 - 0.07 + 0.49\} + 1.1 = 8.8, \\ r_{42} &= 12.2\{0 + 1 + 0.15 + 0.17 + 0.15 + 0.14 \\ &\quad + 0.02 + 0.02 + 0\} + 1.0 = 21, \\ r_{22} &= 3.5\{0 + 1 + 0.09 + 0.23 - 0.18 + 0.05 - 0.05 \\ &\quad - 0.25 - 0\} - 0.5 = 2.6, \end{aligned} \quad (4)$$

where the electronic contribution is given [G. D. Boyd and D. A. Kleinman, J. Appl. Phys. **39**, 3597 (1968)] by  $\epsilon_0 n_i^2 r_{ij,k} n_j^2 \rightarrow 4d_{ijk}$  ( $\xi_{ijk} = 4d_{ijk}$ ) and we have used recent  $d_{ijk}$  data [J. E. Bjorkholm, IEEE J. Quant. Electron. **QE4**, 970 (1968); S. Singh (private communication) ( $d_{33} = (66 \pm 6)d_{36}(KDP)$ )].

**Temperature Dependence of Raman and Rayleigh Scattering in LiNbO<sub>3</sub> and LiTaO<sub>3</sub>**, W. D. JOHNSTON, JR., AND I. P. KAMINOW [Phys. Rev. **168**, 1045

(1968)]. Equations (1) and (7) should read

$$S_{ij,k}^m = \frac{(n_0^m+1)\hbar\omega_s^4 n_s (l d \Omega) |\alpha_{ij,k}^m|^2}{32\pi^2 \epsilon_0^2 c^4 \rho^m \omega_m n_p} \quad (1)$$

and

$$g_s = \frac{8\pi^2 c^2 (S/l d \Omega) (I)}{\hbar\omega_s^3 n_s^2 (n_0+1)\Gamma}, \quad (7)$$

respectively. With these corrections, estimates of  $g_s/I$  in Table I are reduced by  $\frac{1}{2}$  for all cases except H<sub>2</sub> gas.

**Optical Second-Harmonic Generation in Reflection from Media with Inversion Symmetry**, N. BLOEMBERGEN, R. K. CHANG, S. S. JHA, AND C. H. LEE [Phys. Rev. **174**, 813 (1968)]. Two equivalent expressions on the right-hand side of Eq. (25) should be multiplied by a factor  $\sin^2\theta$ . In Eq. (25),  $P_s^{NL}(2\omega)$  should be changed to  $P_s(2\omega)$ , and  $\bar{\delta}$  should be replaced by  $\bar{\delta} \sin^2\theta$  everywhere following this equation. This additional factor comes from the  $\delta(z)$  character of  $E_{2s}$ , which is a direct consequence of the fact that  $D_{2s} = E_{2s} + 4\pi P_{2s}$  should be continuous everywhere and finite even at the surface. Note that this condition is satisfied by the solution of the nonlinear boundary problem obtained by Bloembergen and Pershan [N. Bloembergen and P. S. Pershan, Phys. Rev. **128**, 606 (1962)]. This is also true for a physical model in which the second harmonic wave is assumed to arise from an electric double layer at the surface [C. C. Wang, Phys. Rev. (to be published)].

In the fourth column of Table III, the experimental value for  $\beta$  should be changed from 0.55 to 1.0 for KI.