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Erratum: "Ferroelectric Materials for Microwave Tunable Applications" [J. Electroceram. 11, 5 (2003)]

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1. Equation (3.13) should read

$$E_N = \frac{2}{\sqrt{27\beta\varepsilon_{00}^3\varepsilon_0^3}}$$

instead of

$$E_N = \frac{2}{\sqrt{27\beta\varepsilon_{00}^3}}.$$

2. Equation (3.22) should read:

$$\varepsilon_{\text{mix}}^{-1}(q, E_0) = \varepsilon_0\alpha^* + 3\beta\varepsilon_0 P_f^2 + \frac{q^2(\varepsilon_b - \varepsilon_d)}{\varepsilon_d[\varepsilon_b q + \varepsilon_d(1-q)]} - q\varepsilon_0\left(\alpha + 3\beta P_f^2\right)$$

instead of:

$$\varepsilon_{\text{mix}}^{-1}(q, E_0) = \varepsilon_0\alpha^* + 3\beta\varepsilon_0 P_f^2 - \frac{q^2(\varepsilon_b - \varepsilon_d)}{\varepsilon_d[\varepsilon_b q + \varepsilon_d(1-q)]} - q\varepsilon_0\left(\alpha + 3\beta P_f^2\right).$$

3. Sentence after Eq. (3.22) on page #16 should read:

"In the limit of small concentration of the dielectric material in the mixture ($q \ll 1$) and when $\varepsilon_f/\varepsilon_d \gg 1$, the last two terms in the Eq. (3.22) can be neglected and the renormalized electric field E^* in Eq. (3.20) become equal to the electric field E_0."

instead of:

"In the limit of small concentration of the dielectric material in the mixture ($q \ll 1$) and when $\varepsilon_f/\varepsilon_d \gg 1$, the last three terms in the Eq. (3.22) can be neglected and the renormalized electric field E^* in Eq. (3.20) become equal to the electric field E_0."

4. Equation for the matrix G_{ts} on page #16 should read $G_{ts} = 3n_t n_s - \delta_{ts}$ instead of $G_{ts} = 3n + ns - \delta_{ts}$.
5. Sentence after equation for the matrix G_{ts} on page #16 should read:

"where $\vec{n} = (\vec{r} - \vec{r}_i)/|\vec{r} - \vec{r}_i|$ and δ_{ts} is the Kroneker symbol."

instead of:

"where $\vec{n} = (\vec{r} - \vec{r}_i)/|\vec{r} - \vec{r}_i|$ and δ is the Kroneker symbol. Where φ and θ are the azimuthal and polar angles of the vector $\vec{r} - \vec{r}_i$."

6. Sentence after Eq. (3.25a) on page #16 should read:

   "In this solution, when calculating the dielectric nonlinearity of the composite the second term in Eq. (3.25a) is neglected so that in the ferroelectric matrix one set $\vec{E}_f \approx \vec{E}$."

   instead of:

   "In this solution, when calculating the dielectric nonlinearity of the composite the second term in Eq. (3.27) is neglected so that in the ferroelectric matrix one set $\vec{E}_f \approx \vec{E}$."
7. Sentence after Eq. (3.26) on page #17 should read:

   "where n_r is the tunability of the ferroelectric at the same value of the applied field."

   instead of:

   "where $n_{r,mix}$ is the tunability of the ferroelectric at the same value of the applied field."
8. The calculated value for $Ba_{0.6}Sr_{0.4}TiO_3$ in Table 4 should read 0.1 instead of 0.7–1.4.
9. Figure 13 should read:

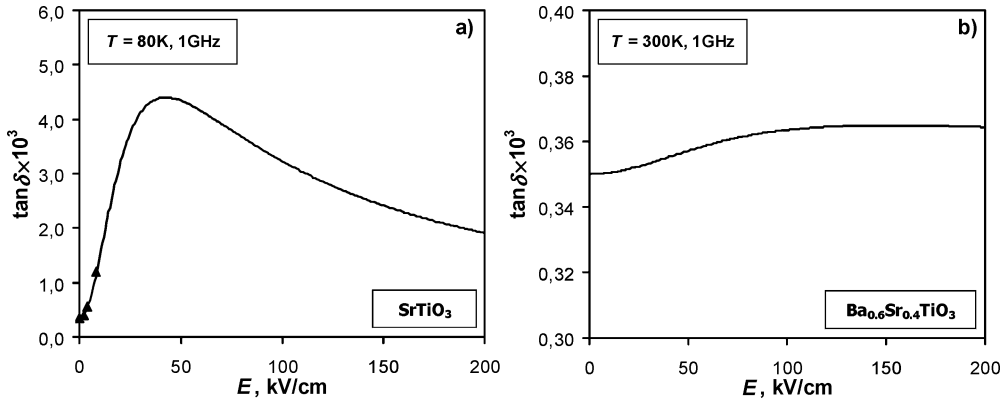

Fig. 13. Simulated field dependence of the loss tangent (solid lines) plotted together with experimental data [2] (black squares) for $SrTiO_3$ (a) and $Ba_{0.6}Sr_{0.4}TiO_3$ (b) crystals; $A_{SrTiO_3} = 17 \times 10^{-3}$ GHz^{-1}, $A_{Ba_{0.6}Sr_{0.4}TiO_3} = 0.1 \times 10^{-3}$ GHz^{-1}. The values of tan $\delta(0)$ are taken from Refs. [2] and [68], respectively.

10. The dimension of the β coefficient in Table 5 should read JC^{-4} m^5 instead of JC^{-4} m^{-5}.
11. Figure 15 should read:

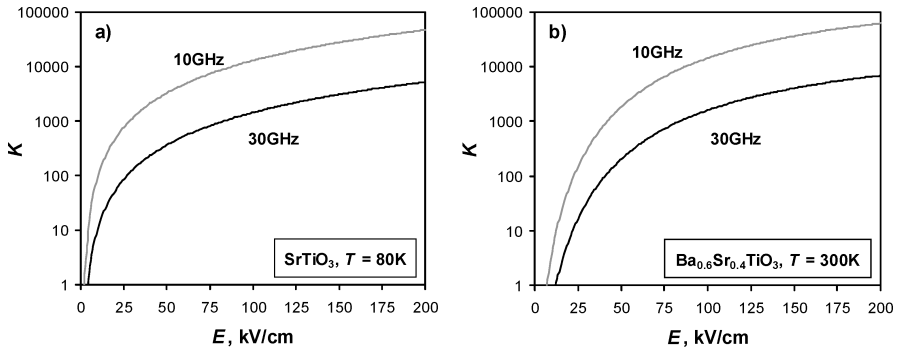

Fig. 15. Calculated field dependences of the quality factor K for $SrTiO_3$ (a) and $Ba_{0.6}Sr_{0.4}TiO_3$ (b) ferroelectrics at frequencies of 10 GHz (grey lines) and 30 GHz (black lines). The calculations were performed for the same material parameters as those used for plotting the graphs in Fig. 13 [67].

12. Equation (3.59) should read:

$$E_{ext} = \alpha P - k\frac{\partial^2 P}{\partial x^2} + \frac{1}{\varepsilon_0 \varepsilon_b}(P - \bar{P})$$

instead of:

$$E_{ext} = \alpha P - k\frac{\partial^2 P}{\partial x^2} + \frac{1}{\varepsilon_0}(P - \bar{P}).$$

13. Equation (3.60) should read:

$$P(x) = \frac{E_{ext}}{\alpha}\left(1 - \frac{\cosh\frac{x-h/2}{\xi_1}}{\cosh\frac{h}{2\xi_1}}\right)\frac{1}{1 + 2\frac{\varepsilon}{\varepsilon_b}\frac{\xi_1}{h}\tanh\frac{h}{2\xi_1}}$$

instead of:

$$P(x) = \frac{E_{ext}}{\alpha}\left(1 - \frac{\cosh\frac{x-h/2}{\xi_1}}{\cosh\frac{h}{2\xi_1}}\right)\frac{1}{1 + 2\varepsilon\frac{\xi_1}{h}\tanh\frac{h}{2\xi_1}}.$$

14. Equation (3.61) should read:

$$\varepsilon_{eff}^{-1} = \varepsilon^{-1} + \frac{2\xi_1}{h}\varepsilon_b^{-1}$$

instead of:

$$\varepsilon_{eff}^{-1} = \varepsilon^{-1} + \frac{2\xi_1}{h}.$$

15. In the section (i) on page #30, the sentence should read:

"However, this result may be taken only as qualitative since the theoretical situation corresponds to the limit of the range of applicability of the continuous Landau theory; the latter is applicable if the typical scale of the polarization variation (ξ in this case) is essentially larger than the lattice constant of the material (4 Å in the case of (Ba, Sr)TiO_3)."

instead of:

"However, this result may be taken only as quantitative since the theoretical situation corresponds to the limit of the range of applicability of the continuous Landau theory; the latter is applicable of the typical scale of the polarization variation (ξ in this case) is essentially larger than the lattice constant of the material (4 Å in the case of (Ba, Sr)TiO_3).".

16. In the section (ii) on page #30, the sentence should read:

"According to Eq. (3.61) the expected relative correction to the bulk permittivity is about $2\xi_1\varepsilon/h\varepsilon_b$, that is some $\sqrt{\varepsilon/\varepsilon_b}$ times stronger than in the case of the in-plane component."

instead of:

"According to Eq. (3.61) the expected relative correction to the bulk permittivity is about $2\xi_1\varepsilon/h$, that is some $\sqrt{\varepsilon/\varepsilon_b}$ times stronger than in the case of the in-plane component."

17. In the section (ii) on page #30, the sentences should read:

    "In this context, Eq. (3.61) might be used as a semi-empirical relation, ξ_1/ε_b being a fitting parameter. An analysis of the thickness dependence of the out-of-plane component of dielectric constant in terms of Eq. (3.61) performed by Vendik and Zubko [82] for (Ba,Sr)TiO_3 thin films yields the values of ξ_1/ε_b in the range of 0.2–2.5 Å."

    instead of:

    "In this context, Eq. (3.61) might be used as a semi-empirical relation ξ_1 being a fitting parameter. An analysis of the thickness dependence of the in-plane component of dielectric constant in terms of Eq. (3.61) performed by Vendik and Zubko [82] for (Ba,Sr)TiO_3 thin films yields the values of ξ_1 in the range of 0.2–2.5 Å."
18. Sentence before Eq. (3.71) on page #32 should read: "In the case of the partial and full depletion, one finds" instead of: "In the case of the full and partial depletion, one finds".
19. Equation (3.71) should read:

$$\frac{1}{\varepsilon_{eff}} = \frac{1}{\varepsilon} + \frac{2\varepsilon_0\beta\rho_0^2W^3}{h}$$

    instead of:

$$\frac{1}{\varepsilon_{eff}} = \frac{1}{\varepsilon} + \frac{4\varepsilon_0\beta\rho_0^2W^3}{h}.$$

20. Equation (3.72) should read:

$$\frac{1}{\varepsilon_{eff}} = \frac{1}{\varepsilon} + \frac{\varepsilon_0\beta\rho_0^2h^2}{4}$$

    instead of:

$$\frac{1}{\varepsilon_{eff}} = \frac{1}{\varepsilon} + \frac{\varepsilon_0\beta\rho_0^2h^2}{2}.$$

21. The thickness of a dielectric layer in Table 6 on page #32 for the case of full surface blocking of polarization should read $\xi_1 = \xi/\sqrt{\varepsilon\varepsilon_b}$ instead of $\xi_1 = \xi\sqrt{\varepsilon_b/\varepsilon}$.
22. Sentence on page #32 should read:

    "For values of W and ρ_0 compatible with the data on ferroelectric perovskite with metallic electrodes, $W = 0.2\ \mu$m and $\rho_0 \cong 1.6 \times 10^{-19} \times 10^{18}$ Ccm$^{-3} = 0.16$ Ccm^{-3} [72, 89, 91] one finds that, in the case of partial depletion (where $h > 2W$), a single depletion layer works as a dielectric layer with $\varepsilon_d = 1$ and thickness $h_d = \varepsilon_0\beta\rho_0^2W^3 \approx 0.1$Å."

    instead of:

    "For values of W and ρ_0 compatible with the data on ferroelectric perovskite with metallic electrodes, $W = 0.2\ \mu$m and $\rho_0 \cong 1.6 \times 10^{-19} \times 10^{18}$ Ccm$^{-3} = 0.16$ Ccm^{-3} [72, 89, 91] one finds that, in the case of partial depletion (where $h > 2W$), a single depletion layer works as a dielectric layer with $\varepsilon_d = 1$ and thickness $h_d = 2\varepsilon_0\beta\rho_0^2W^3 \approx 0.2$Å."
23. The limit "$0.05 < C$ [pF] < 1" for the capacitance C in Table 7 for the resonance methods should be removed.

24. The reference [33] should read:

    "J.G. Colom, R.A. Rodrigues-Solis, J. Almodovar, and M. Castaneda, *Integrated Ferroelectrics*, **42**, 313 (2002)."

    instead of:

    "J.G. Colom, R.A. Rodrigues-Solis, J. Almodovar, and M. Castaneda, *Integrated Ferroelectrics*, **42**, 313 (2001)."

25. The reference [68] should read:

    "L.C. Sengupta, S. Stowell, E. Ngo, M.E. O'Day, and R. Lancto, *Integrated Ferroelectrics*, **8**, 77 (1995)."

    instead of:

    "L.C. Sengupta, S. Stowell, E. Ngo, M.E. O'Day, and R. Lancto, *Integrated Ferroelectrics*, **8**, 821 (1995)."

26. The reference [137] should read:

    "L.C. Sengupta and S. Sengupta, *Mat. Res. Innovat.*, **2**, 278 (1999)."

    instead of:

    "L.C. Sengupta and S. Sengupta, *Mat. Res. Innovat.*, 278 (1999)."