$$\times \left[\frac{1}{\varepsilon'} - 1\right] \tag{A7}$$

where N is the number of unit cells of the direct lattice,

$$\varepsilon' = 1 + \frac{\beta_{14}}{\{m_\alpha m_\beta C^{-1}_{\alpha\beta}\}^{\frac{1}{2}}} \times \left[\frac{1}{m_\gamma m_\delta C^{-1}_{\gamma\delta} \cdot I_3^{\frac{1}{3}}} - \frac{1}{\beta^2_{16}}\right] L(C^{-1}_{\alpha\beta}, I_3) + \frac{\beta_{15}}{m_\alpha m_\beta C^{-1}_{\alpha\beta} I_3^{\frac{1}{3}}} \tag{A8}$$

and

$$L(C^{-1}_{\alpha\beta}, I_3) = \ln\left[\frac{\beta_{16}(m_\alpha m_\beta C^{-1}_{\alpha\beta})^{-\frac{1}{2}} \cdot I_3^{-\frac{1}{6}} + 1}{\beta_{16}(m_\alpha m_\beta C^{-1}_{\alpha\beta})^{-\frac{1}{2}} \cdot I_3^{-\frac{1}{6}} - 1}\right]. \tag{A9}$$

The $\beta_{13}, \beta_{14}, \beta_{15}$ and β_{16} are constants. These expressions involve $C^{-1}_{\alpha\beta}$ and I_3 repeatedly, terms which proliferate upon differentiation with respect to the deformation tensor $C_{\kappa\lambda}$. As a consequence, calculation of higher order derivatives of the band structure contribution with respect to arbitrary deformation becomes extremely tedious.

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