the Γ_4^--resonance mode in NaCl:Cu^+ under uniaxial stress of 100 kp/cm² as taken from data given in reference [11]. The hydrostatic term of the stress Hamiltonian [12] does not enter into our formulas, since we only measure the effect of noncubic distortions. The frequency splitting changes the mean square amplitudes $\langle Q_{4\,i}^2\rangle$ as obtained from the derivative of equation (12):

$$\Delta\langle Q_{4\,i}^2\rangle = -\langle Q^2\rangle \left\{\frac{1}{\omega} + \frac{\hbar}{kT\sinh\frac{\hbar\,\omega}{kT}}\right\}\Delta\omega_i = -\langle Q^2\rangle\, c(T,\omega)\,\Delta\omega_i\,. \quad (13)$$

ω is the frequency of the resonance mode, $\Delta\omega_i$ the frequency shift due to noncubic terms of the stress Hamiltonian. Fig. 5 shows the temperature dependence of $c(T,\omega)$. The high- and low-temperature limits are

$$c(T,\omega) \approx \begin{cases} \dfrac{2}{\omega} & \text{for} \quad kT \gg \hbar\,\omega\,, \\ \dfrac{1}{\omega} & \text{for} \quad kT \ll \hbar\,\omega\,. \end{cases} \quad (14)$$

Inserting (13) into the derivative of (10) and (11) we obtain the expressions for $(f_{||} - f_{\perp})/f$ (Table 1). Two effects contribute to $(f_{||} - f_{\perp})/f = \Delta f/f$ in Table 1:

Table 1

Transitions	P [001]	P [111]	P [011]
$\Gamma_1^+ \to \Gamma_4^+, \Gamma_5^+$	$\frac{3}{2}c(T,\omega)\delta_3 - \frac{1}{2\langle Q^2\rangle}\times\{\Delta Q_{\|\|0}^2 - \Delta Q_{\perp 0}^2\}$	$\frac{3}{2}c(T,\omega)\delta_5 - \frac{1}{2\langle Q^2\rangle}\times\{\Delta Q_{\|\|0}^2 - \Delta Q_{\perp 0}^2\}$	$\frac{3}{2}c(T,\omega)\delta_5 - \frac{1}{2\langle Q^2\rangle}\times\{\Delta Q_{\|\|0}^2 - \Delta Q_{\perp 0}^2\}$
$\Gamma_1^+ \to \Gamma_3^+$	$-3c(T,\omega)\delta_3 + \frac{1}{\langle Q^2\rangle}\times\{\Delta Q_{\|\|0}^2 - \Delta Q_{\perp 0}^2\}$	$-3c(T,\omega)\delta_5 + \frac{1}{\langle Q^2\rangle}\times\{\Delta Q_{\|\|0}^2 - \Delta Q_{\perp 0}^2\}$	$-3c(T,\omega)\delta_5 + \frac{1}{\langle Q^2\rangle}\times\{\Delta Q_{\|\|0}^2 - \Delta Q_{\perp 0}^2\}$

δ_i, the energy splitting of the resonance mode corresponding to Fig. 4, and $\Delta Q_{\|\|0}^2$, the change of the temperature independent $Q_{\|\|0}^2$ by uniaxial stress. $Q_{\|\|0}^2$ is defined by

$$Q_{\|\|0}^2 = \frac{1}{N}\sum_{\text{off-c.}} (\boldsymbol{Q}_{4\,0}\,\boldsymbol{\zeta})^2\,. \quad (15)$$

$\boldsymbol{Q}_{4\,0}$ is the displacement vector of the off-centre position and $\boldsymbol{\zeta}$ the unit vector parallel to the stress axis. $Q_{\perp 0}^2$ is defined in analogy to $Q_{\|\|0}^2$.

The stress effect derived from the linear electron–lattice interaction (3a) in the Hamiltonian (Table 1) depends only on the energy splitting of the resonance mode and on the distortion of the lattice cell, but not on the matrix