Chapter 1

Coefficients of the equation that relates ray parameter and scattered phase angles

This appendix shows the explicit form of the coefficients a_i in equation (**??**), the fourth order polynomial that relates the angles of the scattered phases and the incident ray parameter. The coefficients are

$$\begin{aligned} a_0 &= c^4p^4 - T_0^2, \\ a_1 &= -2T_0T_1, \\ a_2 &= 2b^2c^2p^4 - 4d^2p^4 - T_1^2 - 2T_2T_0, \\ a_3 &= -2T_2T_1, \\ a_4 &= p^4b^4 - T_2^2, \end{aligned}$$

where

$$\begin{aligned} T_0 &= 2\sin^2(\gamma_2) - p^2(c^2 + 2a^2), \\ T_1 &= 2\sin(2\gamma_2), \\ T_2 &= 2\cos^2(\gamma_2) - p^2(b^2 + 2a^2), \\ a^2 &= c_{44}/\rho, \\ b^2 &= (c_{11} - c_{44})/\rho, \\ c^2 &= (c_{33} - c_{44})/\rho, \\ d^2 &= [(c_{11} - c_{44})(c_{33} - c_{44}) - (c_{13} + c_{44})^2]/\rho^2. \end{aligned}$$

The constants c_{ij} are four of the five elastic constants that describe a homogeneous transversely isotropic medium, γ_2 is the orientation of the axis of symmetry measured from the normal to the interface, p is the ray parameter, and ρ is the density.