

between 40° and 50° in Fig. 6, in which are shown the curves of intersection of the wave surfaces with any plane containing the Z axis. As indicated earlier, this is a plot of R_i as a function of $(\Delta + \theta)$.

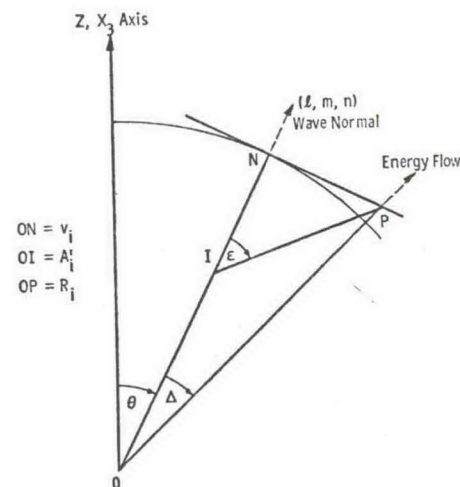


FIG. 3. Relation between wave normal and energy flow direction.

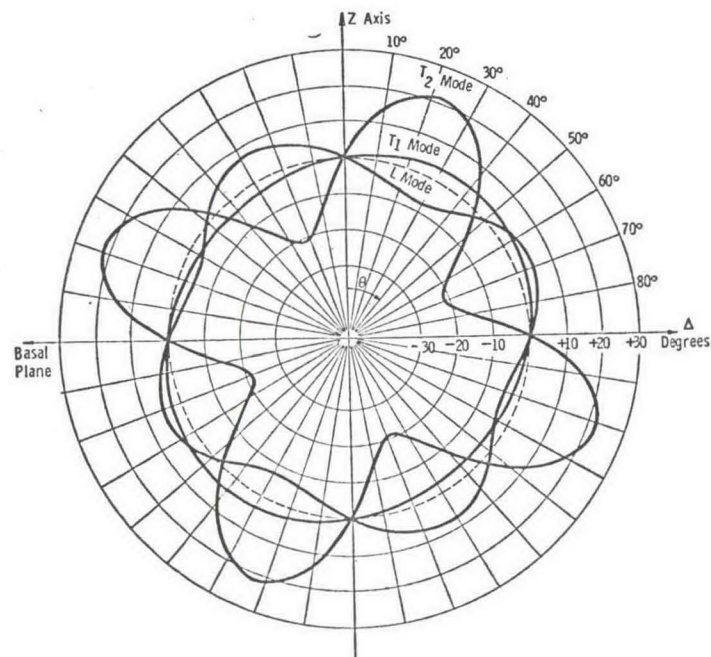


FIG. 4. Deviation of ray from wave normal in ZnS for L , T_1 and T_2 modes in any plane containing Z axis.

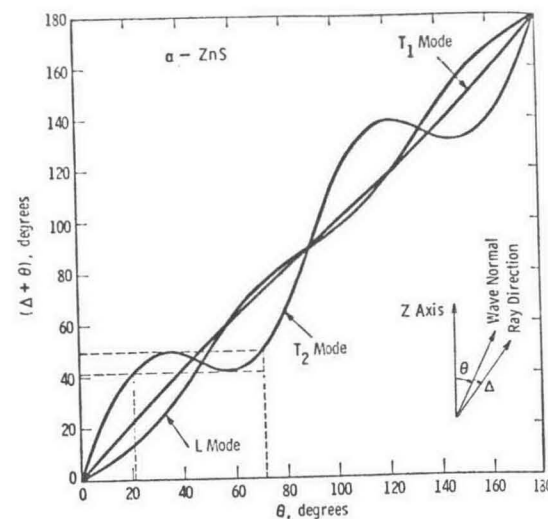


FIG. 5. $(\Delta + \theta)$ plotted as a function of θ for modes L , T_1 and T_2 .

The T_1 mode is always a pure mode and hence the associated displacement vector is always parallel to the basal plane. The L and T_2 modes are

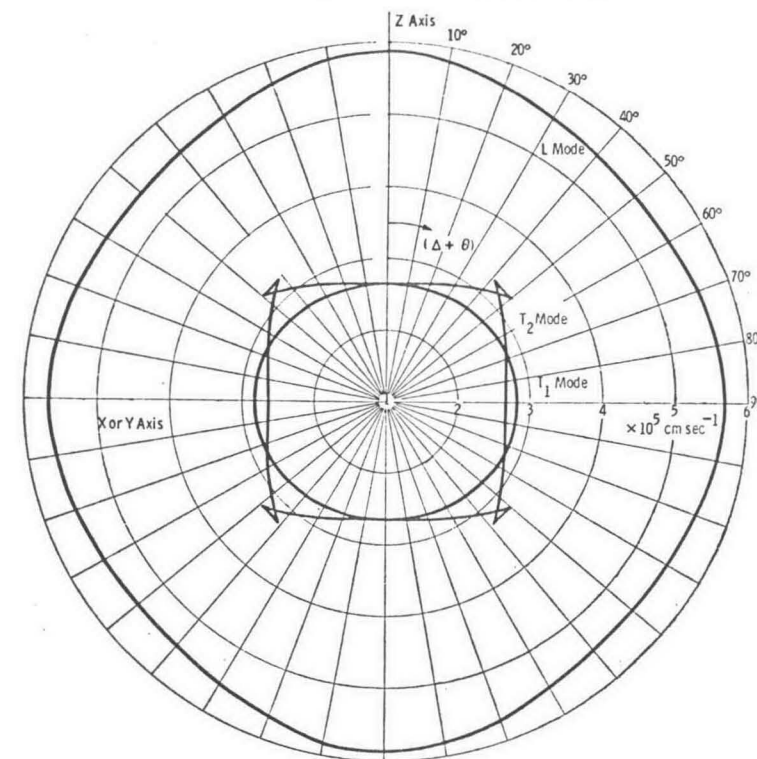


FIG. 6. Curves of intersection of wave surfaces for ZnS with any plane containing the Z axis.

not pure modes except in the basal plane, along the Z axis, and along the cone mentioned in the next paragraph.

The deviation, δ , of the L mode displacement vector from the wave normal for propagation in any plane containing the Z axis is given by⁽³⁾

$$\cos \delta_L = \frac{m^2 n d + n(H_L - m^2 a)}{[(H_L - m^2 a)^2 + m^2 n^2 d^2]^{1/2}} \quad (20)$$

The L and T_2 mode displacement vectors always remain in the plane containing the wave normal and the Z axis. As the three displacement vectors are mutually orthogonal and the T_1 mode displacement vector is always parallel to the basal plane, equation (20) will also give the deviation, δ_{T_2} , for the T_2 mode. Figure 7 indicates how δ varies as a function of θ . This figure indicates that other L , T_1 , T_2 pure mode directions will form a cone, with axis along the hexad axis, and the semi-angle of 50° .

As a comparison with CdS, Fig. 8 shows the curves of intersection of the velocity surfaces with

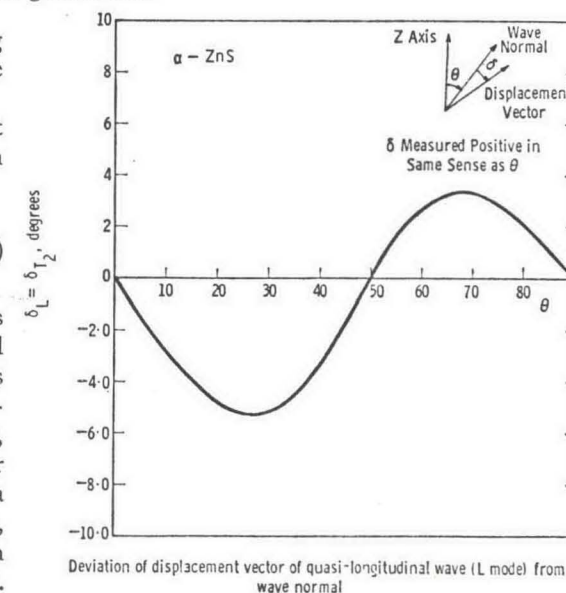


FIG. 7. Deviation of displacement vector of quasi-longitudinal wave (L mode) from the wave normal.