

# NORSAR

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## VII.5 ScS Precursor Waves

In recent years, considerable interest has been focused on S and ScS travel time residuals as such observations are taken as manifestations of lateral velocity anomalies in the mantle, say, beneath continental and oceanic areas respectively. However, in a number of cases the reported ScS residuals are larger than expected from realistic earth models and also occasionally significant energy bursts appear in the interval intermediate between S and ScS arrivals. These features have encouraged us to undertake a detailed investigation of the S-wave coda or more correctly precursors to the ScS-phase. In the distance interval 45-65° we have found several NORSAR recordings exhibiting clear precursor arrivals. The lead times with respect to ScS vary considerably while the lag times with respect to S are fairly constant and amount to around 100 secs. The observed slownesses are equal to or slightly less than those of S and thus differ significantly from those of ScS. Polarization filtering and particle motion diagrams favor SV or SH as the dominant phase motions. The wave parameter observations mentioned above all favor S-wave reflections from horizons of around 200-250 km depth, and in this respect are similar to proposed generating mechanisms of long period precursors to the PP-phase (e.g., see Husebye and Madariaga, 1970, and Ward, 1976). The observations are incompatible with once-suggested generating mechanisms of leaking modes, various types of mode conversions or multipathing due to lateral inhomogeneities in the lower mantle.

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### References

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- Ward, S. (1976): Long period precursors to the phase PP, paper presented at the 1976 Spring Annual Meeting of American Geophysical Union.