

# NORSAR

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Prepared by  
K. A. Berteussen

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VII.2 Inversion of Large Aperture Array Travel Time Data  
for Mapping of Seismic Anomalies in the Lithosphere-  
Asthenosphere

In a recent series of papers Aki et al (1976a,b) and Husebye et al (1976) have demonstrated the usefulness of a novel technique for inverting travel time residuals as observed at large aperture seismic arrays like NORSAR, LASA and the central Californian network. A minor drawback with this approach is that the corresponding computer program has core requirements of the order of 600-800 K bytes. In practice, this means that the program only can be run on very large computers which are not easily accessible and besides are relatively costly. In view of the many requests for copies of the program, we have spent some time on making the program more easily understandable, also more efficient and at the same time obtained a substantial reduction of the core requirements. The main program modifications are tied to splitting the program in two parts, the first one being tied to experimenting with model definitions and at the same time calculating exactly the core storage needed. In the second part of the program where the actual inversion is performed, the core storage savings are mainly obtained by replacing the eigenvalue routine with one that calculates eigenvectors one by one and utilizes intermediate tape storage. In this way only the original input matrix needs to be in single precision while the work vectors could be in double precision, thus diminishing the effect of rounding-off errors as compared to the original version.

E.S. Husebye

A. Christoffersson (Uppsala Univ.)

M. Baer (Zurich Technical Univ.)

References

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