NORSAR

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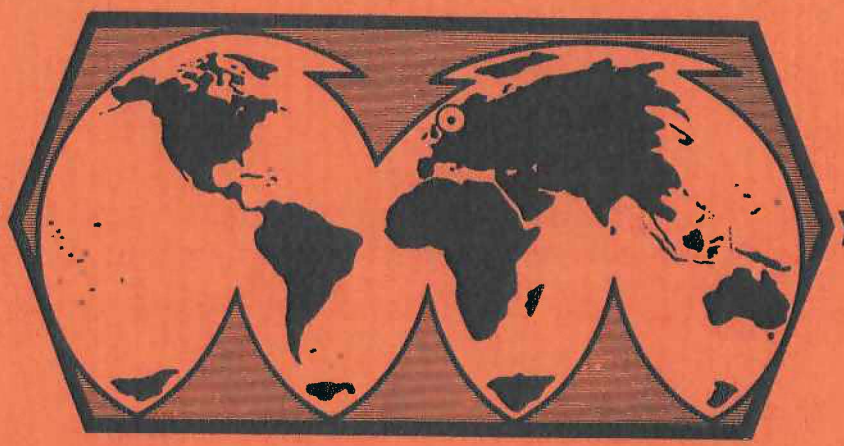
Kjeller, November 1980



VI. SUMMARY OF TECHNICAL REPORTS/PAPERS PREPARED

VI.1 Further Development of the NORESS Small-Aperture Array

From 31 October 1980 the NORESS small-aperture array has been operated with 12 vertical seismometers, all within the 2 km diameter 'old' NORESS 6-channel array. Fig. VI.1.1 shows the new NORESS geometry, with the location of the 6 new stations fed into the central part of the array. Positions relative to the center seismometer are given in Table VI.1.1.

Implementation of the new NORESS geometry was partly motivated by spatial aliasing problems previously encountered in preparing f-k plots, especially in case of high-frequency slow phases (mainly Sn and Lg). The single frequency response pattern for the new NORESS array is given in Fig. VI.1.2, in comparison with the response of the 'old' NORESS array. As is seen in that figure, the new geometry should overcome the problems arising from serious side lobes, as these side lobes are removed from the part of the k-space corresponding to wave numbers $\underline{k}$ ($|\underline{k}| = f/c$, f = frequency, c = phase velocity) that apply in propagation of regional phases. In fact, processing of regional events that have occurred after the change in the NORESS geometry shows that the aliasing problem has been eliminated.

In addition, the new geometry seems capable of giving more stable estimates of phase velocity. Using the technique of computation of frequency-wavenumber spectra, phases independently identified as Pn now exhibit rather consistent phase velocities of 8 km/s, rather than values fluctuating between 7 and 9-10 km/s.

The NORESS evaluation program now continues with processing of data from various subgroups of the 12 channels in order to find an optimal configuration for the final version of our small-aperture array.

S. Mykkeltveit

F. Ringdal

Channel	NS(m)	EW(m)
01B01	132	-253
01B02	136	-101
01B03	-690	-176
01B04	-407	-660
01B05	1232	-502
01B00	5	119
06C01	271	-62
06C02	0	0
06C03	-180	109
06C04	-348	-219
06C05	-33	-365
06C00	-83	-129

TABLE VI.1.1

Positions for the 12 NORESS sensors relative to the center seismometer (06C02)

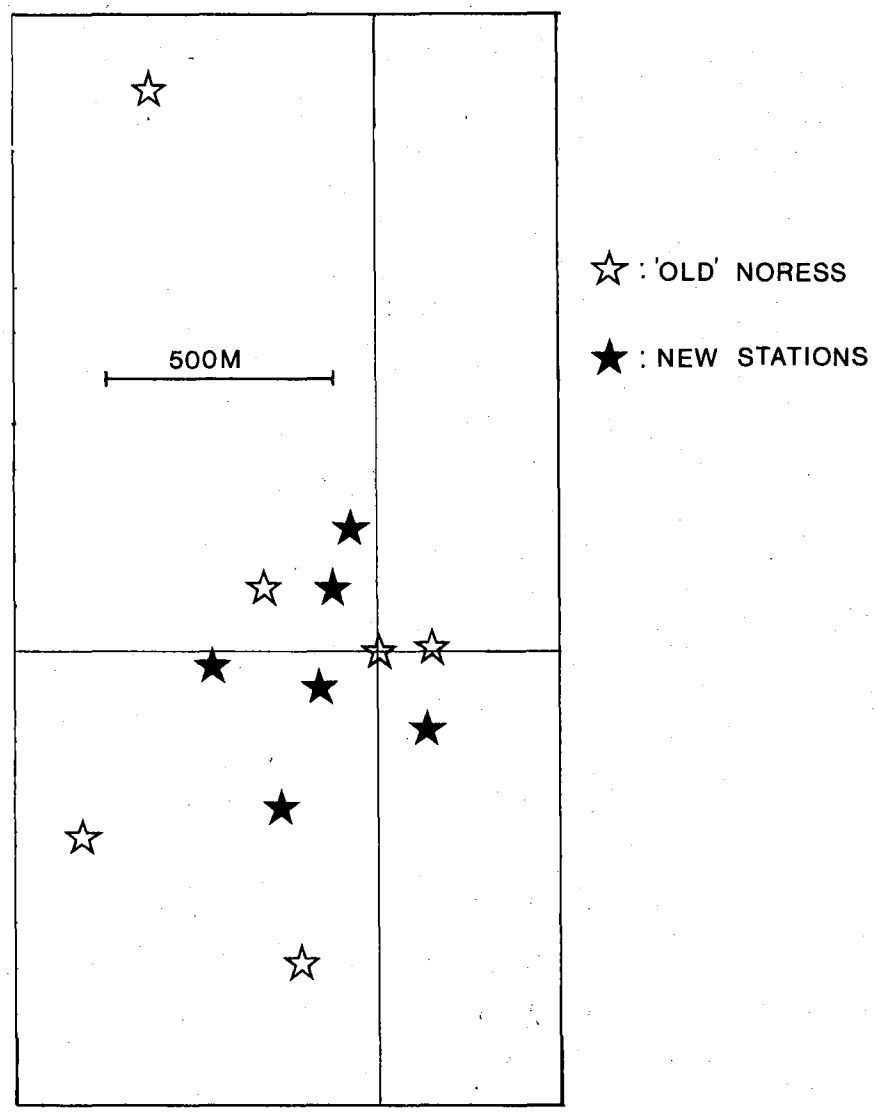


Fig. VI.1.1 Geometry of the new NORESS small-aperture array. All sensors are now equipped with 4.75 Hz low-pass filters.

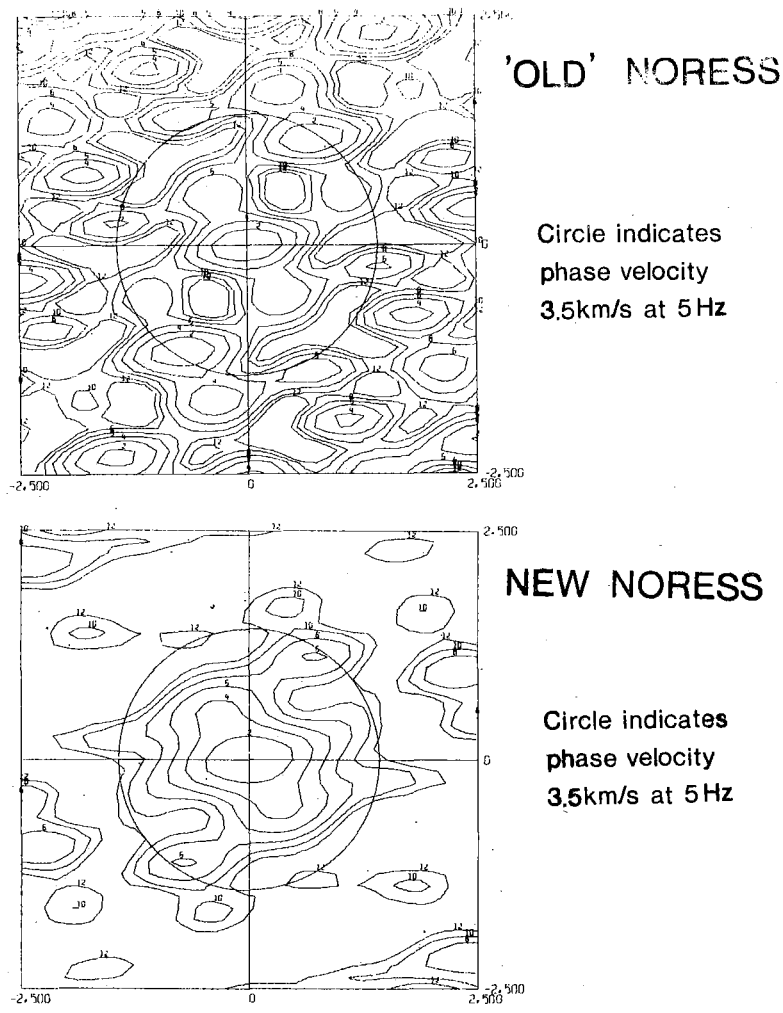


Fig. VI.1.2 Single frequency response patterns for 'old' and 'new' geometries of the NORESS array.