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Precise Continuous Monitoring of Seismic Velocity Variations

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Seismic velocities in the siting area of the Norwegian Seismic Array (NORSAR) have been monitored over a time period of one week using a hydroelectric power plant as a continuous wave generator. Propagational phase angle differences have been measured over travel distances ranging from 4.7–13.7 km, and group velocities of the order of 3.5 km/s are derived. This is close to the expected (phase) velocity for S-waves, and the particle motions derived at a distance of 4.7 km correspond also well with those for S-waves. The obtained precisions are 10^{-3} for a time period of about 2h and 10^{-4} when one week of data are used. The phase difference data contain a semidiurnal spectral component with a peak-to-trough amplitude of around 10^{-3} .

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