



Beginning search for deep moonquake locations on the lunar far side

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The lunar seismograms recorded by the Apollo seismic experiment in the years 1969-77 were recently reviewed again by various workers in the field. Within 12558 detected events, Nakamura (2004) identified more than 7000 events as deep moonquakes originating from 250 separate regions in depths between 700 and 1000km. Nakamura's new survey identified deep moonquake nests located on the far side of the moon, where no deep quakes were found previously (strictly speaking: except one). Our study aims at locating far side deep moon quakes from seismogram stacks on the basis of this new catalog.

Before stacking, a despiking scheme was applied. Errors due to bit flips in radio transmission can usually be identified by the amplitude of the resulting spikes. The damaged samples are set to zero. Thermal contraction often produces cracking sounds in the instruments which result in seismometer impulse response signals. These are identified by cross correlation with the mean waveform of these signals and removed by subtraction of this mean waveform. Of all traces of one cluster, stack traces are computed as weighted mean of the individual events with weights reflecting the signal quality.

Wadati diagrams are drawn to check plausibility of arrival time readings and to obtain information about the v_p/v_s ratio.

We are currently developing software for 3D hypocenter determination using a non-linear grid search method and an error representation according to the interval arithmetics concept. We show examples from Saturn V rocket stage impacts located with a 2D prototype version of this software to illustrate the performance of the algorithm.