

3.3-P26. PSAR: experiments with a medium-sized full 3-component seismic array

Since 2012, Geoscience Australia is operating a full 3-component seismic array with an aperture of ~ 20 km in Northwest Australia. This presentation uses data obtained from this array to investigate the usefulness of having a full 3-component array versus one with vertical components only. First, a comparison is made between two coherency based detection algorithms for 3-component data. One is based on rotating the horizontal components to radial and transverse before detecting on each of the three components individually, and one based on using the coherency of the 3-D surface motion vectors directly. The latter method is found to be much faster and more stable. Subsequently, we investigate the coherence of P and S wave fronts arriving at the array. It is found that at the location of PSAR, regional S waves are much less coherent than P waves. At frequencies above 1 Hz that are of interest for smaller events and nuclear monitoring, S waves are coherent over distances of a few kilometres at best. This indicates that a medium size 3-component array only marginally improves S wave detection capability over a single 3-component instrument.

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