Since 1998, Australia’s WOMBAT array has been leap-frogging across the continent. Each subarray within WOMBAT consists of 30-72 short-period seismometers with solid-state recorders deployed for 6-12 months. Station spacing is 15-50 km, resulting in high-resolution coverage at the continent scale. Over 500 short-period stations have since been deployed in southeastern and eastern Australia. The lack of anthropogenic noise for most stations, and the presence of low attenuation in parts of the upper mantle, enable good signal-to-noise ratio and make the dataset ripe for detailed seismic investigations.

Recent work has focused on differential attenuation tomography, whereby we extend prior travel time tomography studies to utilise amplitude data for analysis of the attenuation structure of the lithosphere and upper mantle. We modify the adaptive stacking code of Rawlinson & Kennett [2004] to include frequency-dependent differential $dt^*$ attenuation measurements. One advantage of using adaptive stacking is that a large amount of data becomes usable that otherwise has a low signal-to-noise ratio. Analysis of teleseismic $P$ waves recorded mainly from earthquakes in the surrounding subduction zones shows good structural coherency with travel time tomography. The method appears to work well with the short-period WOMBAT data, as coherent patterns of $dt^*$ are observed for many events.

We aim to provide a comprehensive picture of the attenuation structure of the southeastern portion of Australian continental lithosphere and, further, to enable direct comparison and integrative interpretation with travel time anomalies (Rawlinson et al 2010) and anisotropy measurements (Heintz, et al 2005).