

## Enhanced Beam Steering Capability for the TIGER SuperDARN radars

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The two Tasman International Geospace Environment Radars (TIGER) are the Australian contribution to the international Super Dual Auroral Radar Network (SuperDARN) which contains many HF over-the-horizon radars in both hemispheres. The first radar is located on Bruny Island Tasmania and the new Unwin radar is located near Invercargill on the South Island of New Zealand. SuperDARN radars use a phased array of 16 transmit/receive antennas and 4 receive only interferometer antennas. Beam steering is performed by an analogue phasing matrix with 16 fixed beams separated by 3.24 degrees and covering a field of view of approximately 52 degrees.

Three new phasing boxes which add additional time delay to the signals sent to each antenna of a phased array have been built by La Trobe University to increase the field of view of the TIGER SuperDARN radars. The first phasing box, designed to rotate the field of view of the Bruny Island radar to view over Macquarie Island, has been used to gather data for comparison with instruments located on Macquarie Island. The second phasing box was designed to rotate the field of view of the Bruny Island radar to the magnetic conjugate point of the High Frequency Active Auroral Research Program (HAARP) ionospheric heater near Gakona, Alaska. The third phasing box was designed to rotate the Unwin radar field of view to observe F-region scatter above the E-region scatter observed in the nearest range gates of the Bruny Island radar and has been placed on Channel B of the Unwin radar to allow for continuous operation during common time.