Recent results from the AMISR Systems (PFISR and RISR)

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The first face of the Advanced Modular Incoherent Scatter Radar (AMISR) was installed at the Poker Flat Research Range north of Fairbanks, Alaska, and became fully operational in March 2007. This system, a phased-array radar for ionospheric studies, had been under development for the National Science Foundation for several years and that development progressed in a staged manner with several prototype systems fielded and tested at different geographic locations. The first panels of the system were field tested near SRI's facility at the 'Big Dish' above the Stanford University campus in California. Subsequent system testing occurred at the Jicamarca Radio Observatory in Peru and at the HAARP ionospheric modification facility near Gakona in Alaska. The Poker Flat Incoherent Scatter Radar (PFISR) was the first AMISR implementation with full incoherent scatter capabilities at geophysically interesting integration times. Geomagnetically, it is an auroral zone system.

A second AMISR face has now been installed very near the magnetic north pole at Resolute Bay, Nunavut, Canada. This face (called RISR for short) is similar, but not identical to, the Poker Flat installation. In addition to its very different geomagnetic location, Resolute Bay's face is also oriented differently and has a number of system improvements adding to the flexibility and utility of that radar.

One of the most interesting attributes of the AMISR systems is their ability to steer on a pulse-by-pulse basis. This rapid redirection of the look direction uniquely supports the separation of temporal and spatial changes in the ionospheric plasma. One of the first experiments performed with the completed RISR utilized this steering capability to estimate latitudinal and temporal variations in the electric fields above and to the North of Resolute Bay. This talk will show some of these early results and discuss the details of the system configuration and post processing needed to produce them. It will also survey some interesting results from the first years of operations with PFISR.