

The Future of HAARP in Alaska

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The High frequency Active Aurora Research Program (HAARP) in Gakona Alaska is the most powerful and versatile laboratory in the world for active experimentation in the ionosphere and upper atmosphere. Many systems are affected by propagation through or into the ionosphere including communication, navigation, radar and others. HAARP consists of an HF phased array with 180 antennas spread across 33 acres with a transmit power of 3.6 MW. The array is powered by five 2500 kW generators, each driven by a 3600 hp diesel engine (4 + 1 spare). Transmit frequency can be chosen anywhere in the range 2.8 to 10 MHz and complex configurations of rapidly slewed single or multiple beams are possible. The HAARP facility was recently transferred from the Space Vehicles Directorate of the Air Force Research Laboratory (AFRL/RV) in Albuquerque, NM to the Geophysical Institute of the University of Alaska Fairbanks (UAF/GI). The transfer is being implemented in stages including a Cooperative Research and Development Agreement (CRADA) and an Educational Partnership Agreement (EPA) which provide access to the facility and ownership of the equipment. Additional agreements are under development to transfer ownership of the land. The UAF/GI plans to operate HAARP for continued ionospheric and upper atmospheric experimentation. In their 2013 “Decadal Survey in Solar and Space Physics” the National Research Council (NRC) made the recommendation to “Fully realize the potential of ionospheric modification...” and in their 2013 Workshop Report: “Opportunities for High-Power, High-Frequency Transmitters to Advance Ionospheric/Thermospheric Research” the NRC outlined the broad range of future ionospheric, thermospheric and magnetospheric experiments that could be performed with HAARP. The HAARP facility contains a variety of RF and optical ionospheric diagnostic instruments to measure the effects of the heater in real time. The UAF/GI encourages the scientific community to plan experiments at HAARP and bring their remote sensing instruments to HAARP for extended or permanent operation. The power and flexibility of HAARP and its ideal location in the subarctic will help secure the future of this facility as the foremost laboratory for active experimentation in the ionosphere and upper atmosphere.