

Results from UHF and HF radar studies of ionospheric interaction experiments at HAARP

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High power HF radiowave experiments have begun at the HAARP Ionospheric Research Observatory in Gakona, Alaska. The SuperDARN HF radar station in Kodiak, Alaska is now routinely employed to monitor HF backscatter from irregularities formed in the interaction volume over HAARP. A 16-panel prototype of a new UHF radar facility, MUIR, has recently become operational on the HAARP site. Complementary to these radar probe diagnostics are new stimulated electromagnetic emissions (SEE) receivers which record the electromagnetic emissions that propagate to the ground. Radio-induced aurora are monitored. We report on series of experiments performed at HAARP which employ all of the new radar, optical, and SEE diagnostics. Employing HF pump pulses of varying lengths (from milliseconds to tens of seconds), we are able to reproduce, analyze, and compare prompt temporal and spectral signatures of Strong Langmuir Turbulence (SLT) measured by the HAARP MUIR UHF radar. The HF radar measures the evolution of irregularities which may be compared with features in the UHF backscatter. These results are compared to measurements of SLT previously performed at other HF heating facilities.