

HEATER-INDUCED ARTIFICIAL AIRGLOW OBSERVATIONS FROM A RECENT CAMPAIGN AT THE HAARP FACILITY

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An artificial airglow campaign was conducted from January 31 to February 19, 2002 at the High Frequency Active Auroral Program (HAARP) in Gakona AK (62.39N, 145.15W). 630nm and/or 557.7nm artificial airglow was observed on thirteen nights during the campaign. The campaign was a collaborative effort with participating instruments from a number of institutions. Three cameras were located at the HAARP facility: an all-sky imager, a 60 degree field of view camera, and a telescopic imager (~1 degree field of view). Two cameras were located off-site for side view imaging—one at Poker Flat Research Station, and the other alternating between Nenana AK and HIPAS. An SEE receiver was operated in Gakona and the Kodiak SuperDARN radar was run in a dedicated mode for part of the campaign. In addition data was gathered throughout the campaign by the HAARP diagnostic instruments including a riometer, magnetometer, digisonde, ELF receiver, and TEC tomographic system. Several preliminary results have emerged from observations during the campaign. Bright 630nm (several hundred Rayleighs) and 557.7nm (over 50R) airglow were observed simultaneously during F-layer heating. A dramatic enhancement in airglow brightness was observed when the HAARP heater beam was aimed along the magnetic field lines (15 degrees from vertical). Both structured and non-structured airglow was observed at 630nm and 557.7nm. Patchy 557.7nm airglow was observed to drift through the heated region. The airglow region was displaced within the calculated 3dB heater beam. Altitude calculations were performed from sideview triangulations at HIPAS and Poker Flat. Sideview imaging revealed that structure observed in the airglow region was field-aligned. The airglow spot size did not vary at the same rate as the beamwidth at heater frequencies of 7.8MHz to 3.3MHz. Artificial airglow was observed during periods of spread-F. Data from the various participating instruments illustrating these results will be presented.