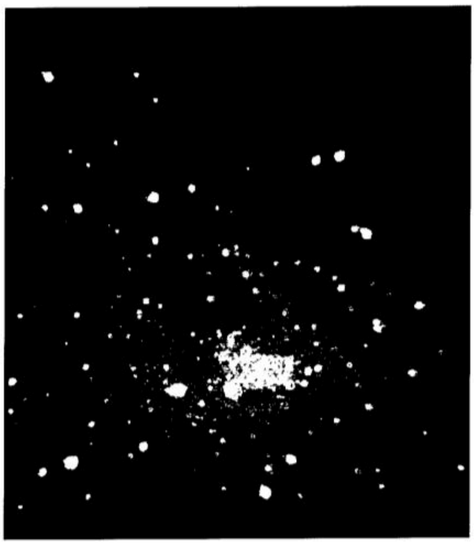
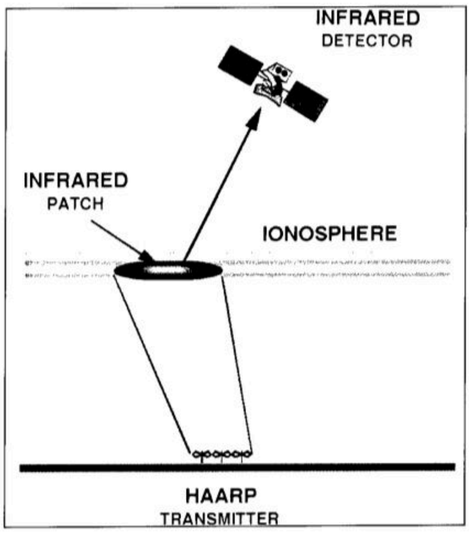
Optical Frequencies



Artificial airglow excited by high-power radio waves

Under steady-state conditions, a significant fraction of the HF power absorbed by the ionospheric electrons results in atomic and molecular excitation and reradiation in a wide range of optical frequencies. It is expected that, at its highest beam intensity, the HAARP heater will produce airglow with megawatt power mainly in the visible and IR region of the spectrum. The IR emissions are predominantly caused by the indirect excitation of CO_2 molecules and propagate undisturbed upwards, while they are absorbed downwards. They can be detected from properly instrumented satellites located within the line of sight of the modified region. Of particular importance is the proposed U.S.-Russia "RAMOS" satellite, whose orbit will fly over the HAARP site frequently. Measuring the IR and optical emissions with good spatial resolution provides a wealth of information about the state of the ionospheric region in which they were generated, including neutral density structure, wind dynamics, and relative abundance of the IR emitters. The IR emissions, including the potential for striating their source region, have significant military implications to IR detection and countermeasures.



HAARP as an instrument of IR diagnostics of the atmosphere

HAARP – BASIC RESEARCH

Guiding Light to the Future

The wide range of applications of HAARP as a remote sensing and communications instrument represents the fruition of many years of basic ionospheric research conducted in previous, much weaker and less sophisticated installations. In terms of both effective radiated power and flexibility of operation, HAARP constitutes a major advance in ionospheric transmitters. Its design requires that the combination of frequency and the radiated power density exceed the theoretical threshold in which new physical phenomena are expected. Such phenomena include strong nonlinearities associated with solitary waves, onset of turbulence, generation of energetic electron fluxes, IR emissions, and very short scale structures. Past lessons

exploration of the response of nonlinear physical systems under new dynamic conditions. The HAARP will be the guiding light to the future, in a similar fashion