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- A PROPOSED NEW SCATTER FACILITY IN NORTHERN SCANDINAVIA -

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ABSTRACT

It is proposed that a new versatile ionospheric and atmospheric scatter radar be constructed in northern Scandinavia through a multinational collaborative effort. The new facility, tentatively named HISCAT (High frequency, High power, High latitude, Heating and Ionospheric Scatter facility), should be used for scientific investigations of: the physics of the neutral (middle) atmosphere; fundamental plasma phenomena, natural or artificially induced in the ionosphere; electrodynamic conditions at high altitudes above the auroral region and in the polar cap ionosphere; plasma waves in the solar atmosphere (if technically feasible).

The system should thus be able to operate as a MST radar, a so-called ionospheric modification ("heating") facility, incoherent-scatter radar, coherent-scatter radar, and solar radar. It would complement the existing facilities EISCAT, Heating, STARE, SOUSY, and ESRANGE also located in northern Scandinavia and should be operated in close coordination with these.

Basically, the new facility should be a device that can operate simultaneously on several frequencies in the frequency range 5-50 MHz not covered by other instruments. It should comprise: powerful transmitters, capable of delivering a total average power of several megawatts; an advanced phased antenna array of high gain (30-40 dB) forming one or two steerable and well collimated beams; an advanced data collection and analysis system.

It is proposed that the facility be located out on the ESRANGE field to facilitate real coordination with sounding rocket experiments, minimize interference, and obtain a suitable geometry for coordinated experiments with EISCAT.