2022 Workshop: Active Experiments

Long title
Active Experiments for IT Forcing
Conveners
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Description

Artificial Energy Inputs to the Ionosphere-Thermosphere System include (1) High Power HF Radio Waves (HAARP, EISCAT Heating, Arecibo HF, SURA), (2) VLF Waves for Wave Induced Particle Precipitation (Satellite VLF Wave Transmitters, HF Electrojet Modulation, Ground VLF Transmitters, Moduled Electron Beams, Rocket Exhaust Driven Amplification) and (3) Rocket and Satellite Neutral Injections (Sounding Rocket Barium and Samarium Releases, Spacecraft Engine Burns). With these inputs, The Thermosphere and Mesosphere Response to Active Experiments with (a) VLF Wave Generation and Amplification, (b) Ionosphere Plasma Irregularities and Density Enhancements, and (c) Enhanced Optical Emissions and X-Ray Fluxes. This workshop will review Active Experiments in several areas. Diagnostics of Artificial Disturbances will be covered to include HF and Incoherent Scatter Radar, HF Radio Sounding and Riometers, Satellite Radio Beacon, Satellite In Situ Wave and Particle Detectors, X-Ray Balloon Experiments. Active Experiments provide Upper Atmosphere Model Testing with Transient Magnetosphere-Ionosphere Coupling, Sustained Response to Energetic Electron Precipitation, Artificial Plasma Cloud Generation and Stabilization, and Active Experiment Predictions

Agenda

Active Experiments for IT Forcing 23 June 2022
Workshop Agenda
13:30 Paul Bernhardt - Overview of Ionospheric Modification – Paul Bernhardt
13:45 Alex Chartier - SuperDARN and HAARP
14:00 Don Hampton - Optical Diagnostics of Active Experiments
14:15 Romina Nikoukar - Radio Beacon Tomography Applications for Active

Experiments –
14:30 Paul Bernhardt, Mark Conde, and Don Hampton - HAARP Making the Invisible Visible
14:45 Phil Erickson - Radar Diagnostics of F-Region Rocket Burns
15:00 Paul Bernhardt - Ionospheric Amplification of Whistler Waves in Space
15:15 Bob McCoy - Current Status of Active Experiments at the University of Alaska
15:25 Paul Bernhardt - Call for Proposals to HAARP for October 2022
15:30 End

Justification

A wide range of active experiments are being conducted with ground HF and VLF transmitters, satellites with wave and particle sensors, and sounding rocket launches. These experiments will provide a broad range of in situ and remote sensing data on both understanding the extreme states of the ionosphere and thermosphere system as well as providing some local control on this system. This workshop will bring together both experimentalists and modelers to plan future campaigns using HAARP, hosted payloads on the ISS, and experiments of opportunity.

Related to CEDAR Science Thrusts:
Explore exchange processes at boundaries and transitions in geospace
Fuse the knowledge base across disciplines in the geosciences
Workshop format
Short Presentations
Keywords
Particle and Wave Injections, Thermospheric Response, Model Testing
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