

DASI: DISTRIBUTED ARRAYS OF SMALL INSTRUMENTS
FOR SPACE SCIENCE RESEARCH

John C. Foster

MIT Haystack Observatory, Atmospheric Sciences Group

Recent ground-based radar and radio-propagation research has revealed space weather storm fronts which sweep across the Americas during strong geomagnetic disturbances. Mesoscale and spatially and temporally localized processes and effects play a significant role in the interconnection between the high-altitude magnetosphere and Earth's ionosphere and lower atmosphere. In order to address the physical causes and characteristics of such space weather phenomena, a means of providing high spatial and temporal resolution observations of Earth's upper atmosphere is needed. In recognition of this need, the NAS Solar and Space Physics Decadal Survey has recommended that the next major ground-based instrumentation initiative for space science research be the deployment of widely-distributed arrays of small instruments. Analogous to the meteorological arrays which support terrestrial weather research, modeling, and predictions, space weather arrays will provide continuous real-time observations of Earthspace with the resolution needed resolve mesoscale phenomena and their dynamic evolution. Ground-based DASI instrumentation will address the need for observations to support the next generation of space weather data-assimilation models and will push our understanding of the physical processes which interconnect the spheres of Earthspace to a new level. Planning for the deployment of DASI will involve the development of miniaturized and robust instruments and instrument clusters and the ability to communicate with them in real time and to distribute their data to a wide variety of users.

The NAS Committee on Solar and Space Physics (CSSP) is preparing a report on the scientific need for such arrays, the infrastructure needed to support and utilize them, and an implementation plan for their deployment. There are many opportunities for the involvement of the radio science community in DASI - both in its current planning stage, and in its implementation over the coming decade. The current status of the DASI initiative will be reviewed and an outline of the NAS report addressing the compelling science issues to be addressed by small instrument arrays will be presented.

Abstract Submission Form

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1. (a) John Foster
MIT Haystack Observatory
Route 40
Westford, MA
01886 USA
jfoster@haystack.mit.edu
- (b) 7819815621
- (c) 7819815766
2. G - Ionospheric Radio and Propagation
3. (a) Radio/Radar Techniques
4. C - Contributed Paper,
Program chair: (John Sahr
Frank Lind)
5. DASI is a new instrument to support a broad range of radio and space science activities