Geophysical Research Abstracts, Vol. 7, 10419, 2005
SRef-ID: 1607-7962/gra/EGU05-A-10419

Monitoring the ionosphere in space and time

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If the diverse phenomena of the ionosphere are to be properly understood the ionosphere must be monitored in both space and time, where monitoring is to be distinguished from ad-hoc sampling. The exploration of different questions imposes different requirements on the spatial coverage, spatial density and temporal resolution of measurement. A range of different instruments with monitoring capabilities exist, including ionosondes, HF radars and LEO satellites. These are discussed and compared from the perspective of how they address these different measurement requirements.

The purposes for which monitoring data are used also impose requirements on data archiving, access and distribution systems. For example, a study of long-term change has very different data needs from a system warning of propagation conditions likely to affect HF communication systems. These differing needs are discussed with particular emphasis on how they are likely to be addressed in the coming era of Grid computing.