

WG4.4 - Ionosphere and Upper Atmosphere Variability in Theme 4 “Space Climatology”

What is climatology?

- i) Regional
- ii) Long-term
- iii) Describes the mean state density, dynamics, temperature, composition
- iv) Describes secular change in the mean state
- v) Used to define climate anomalies

WG 4.4 Ionospheric and upper atmosphere variability

General emphasis should be on:

- a) Fuelling research towards the key goals of the peer scientific community and their stakeholders
- b) Scientific purpose - understand limitations, assumptions, and comparative value of datasets
- c) Cohesion of mesosphere, thermosphere and ionosphere observations and model output

WG 4.4 members (Co-leads: Martin Jarvis, John Emmert)

Thomas Ulich	Long-term variability in ionospheric and solar data; MLT climatology; Sun-Earth Connections; High latitude	Finland
Alexei Danilov	MLT trends. Ionosphere – mid-latitude. Information on E. European datasets.	Russia
Jan Lastovicka	Trends in MLT – particularly via radio wave techniques. Proactive link to IAGA/ICMA re MLT trends	Czech Republic
Gary Burns	Antarctic MLT. Whole atmosphere links. Spectroscopy - lower thermosphere temperatures	Australia
Jorge Chau	Equatorial perspective, Incoherent scatter, Ionospheric data & metadata	Peru
Rick Niecejewski	Winds and temperatures in upper thermosphere, Active preservation of long-term FPI data	USA
Henry Rishbeth (specialist consultant)	Long-term ionospheric trends. MLT basic physics 'guru'. Keen advocate of data preservation and outreach	UK
+	Mesosphere	
+	MLT Modelling	

+ Essential we have scope for co-opting experts as we progress

Some suggestions re WG 4.4 scientific emphasis-

- a) Ionospheric F-layer height and density variations
- b) Thermospheric density and temperature variations
- c) Mesospheric climatology and change
- d) 'Standard method' data analysis and plotting tools – so everyone can use the same process on their own local data, for clear comparison
- e) Common statistical metadata

WG 4.4 links within Theme 4

WG 4.1 Solar irradiance

- directly relevant to variability in ionospheric densities, thermospheric winds etc etc

WG 4.2 Heliosphere, reconnection, geomagnetic field, aurora etc

- directly relevant to variability in thermospheric temperature, statistical quality of ionospheric data, solar cycles, regional differences, altitude of F-layer etc etc

WG 4.3 Radiation Belts precipitation

- directly relevant to variability in mesospheric chemistry, F-layer densities, D-region profiles, long-term human influences.