CAWSES-Theme 4
(Space Climatology)

Co-chairs: *Claus Froehlich (Switzerland) and Jan Sojka (USA)*

Presented by D. Pallamraju on behalf of the Co-Chairs for Theme 4

CAWSES Group 4.4
Climatological variations of the ionosphere and upper atmosphere

R. Niciejewski

J. Emmert

Presentation made at CEDAR workshop on Climatology / Long-Term Trends at the CEDAR annual workshop.

WG 4.4 members

- WG4.4 is "Climatological variations of the ionosphere and upper atmosphere"
  - Co-Leaders are M. Jarvis and J. Emmert
  - Core panel includes 8 more investigators
  - Represents a cross-section of the international aeronomy community

Charter

- Mission
  - Articulate, clarify, and advance community knowledge of climatology and trends in the ionosphere and upper atmosphere
  - Promote collection, availability, quality control and analysis of long term data
- Focus
  - Assess and document quality of long-term data sets
  - Establish standardized procedures for producing climatologies
  - Promote preservation and dissemination of data sets
  - Advocate for new measurements to "fill in the gaps", and to continue existing measurements
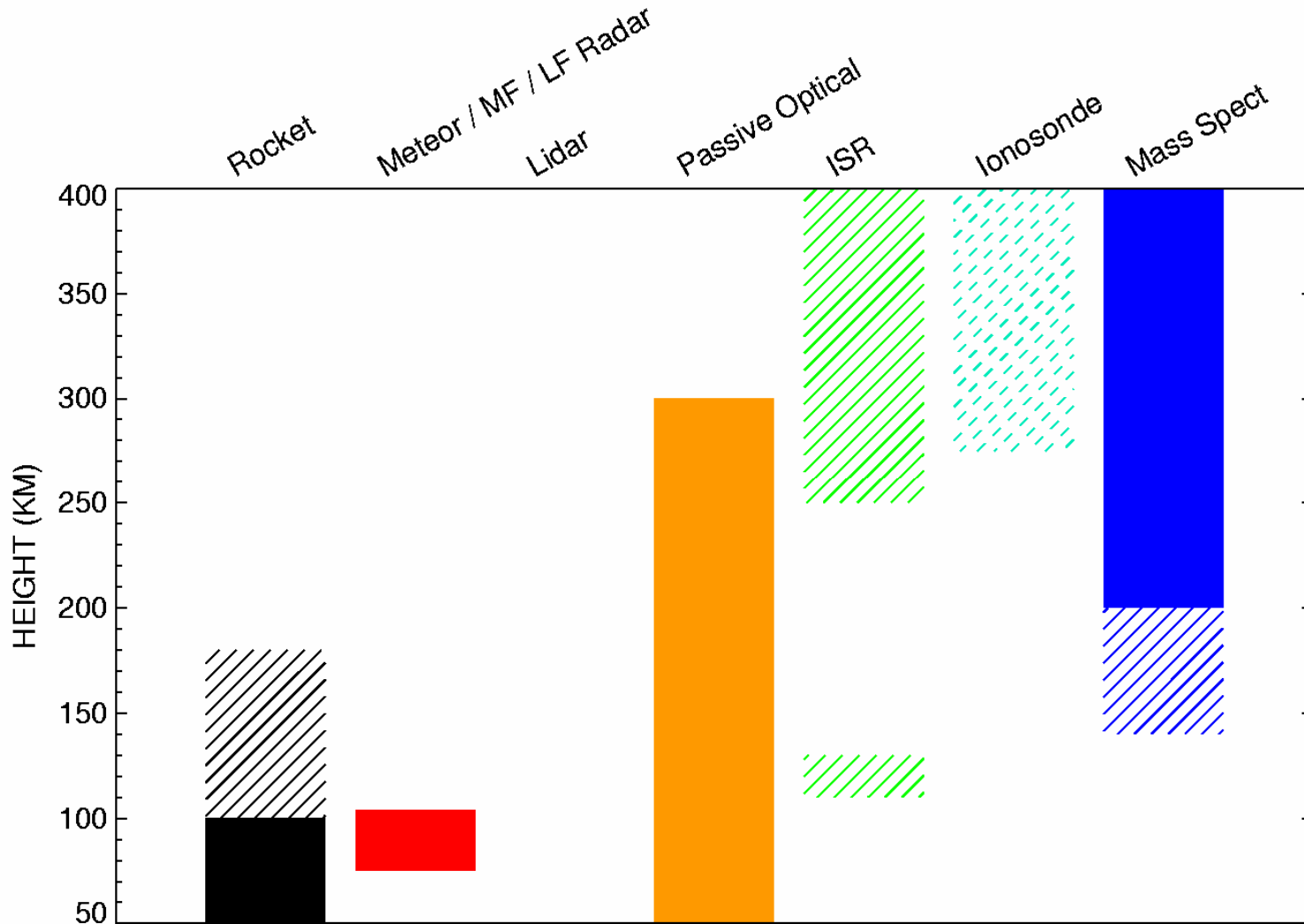 - Determine key climatological issues

Step 1: definitions

- Definitions
  - Climatology: the mean state of a system within a given parameter space; an average over a certain time period; also include variability; the key element is repeatability
  - Component: dependent variable, e.g. number density, wind, temp, for both neutral and ionized elements
  - Parameter: independent variable, e.g. (lat, lon, alt), (hr, day, season), solar (EUV, F10.7, solar wind, IMF), geomagnetic (Kp, Dst)
  - Trend: the time dependent change of climatology
    - Monotonic evolution of the system
    - LONG term periodic change, time greater than data span
   - Sudden and rapid shift of the mean

Step 2: data survey

- WG 4.4 survey is in progress
  - Climatological data needs in the mesosphere, thermosphere, and ionosphere
- Coverage
  - Component vs altitude, latitude, longitude
  - Component vs time span of archive
  - Component vs time of day
- Results
  - Documented the spatial/temporal coverage of components
  - Documented the "gaps" in coverage
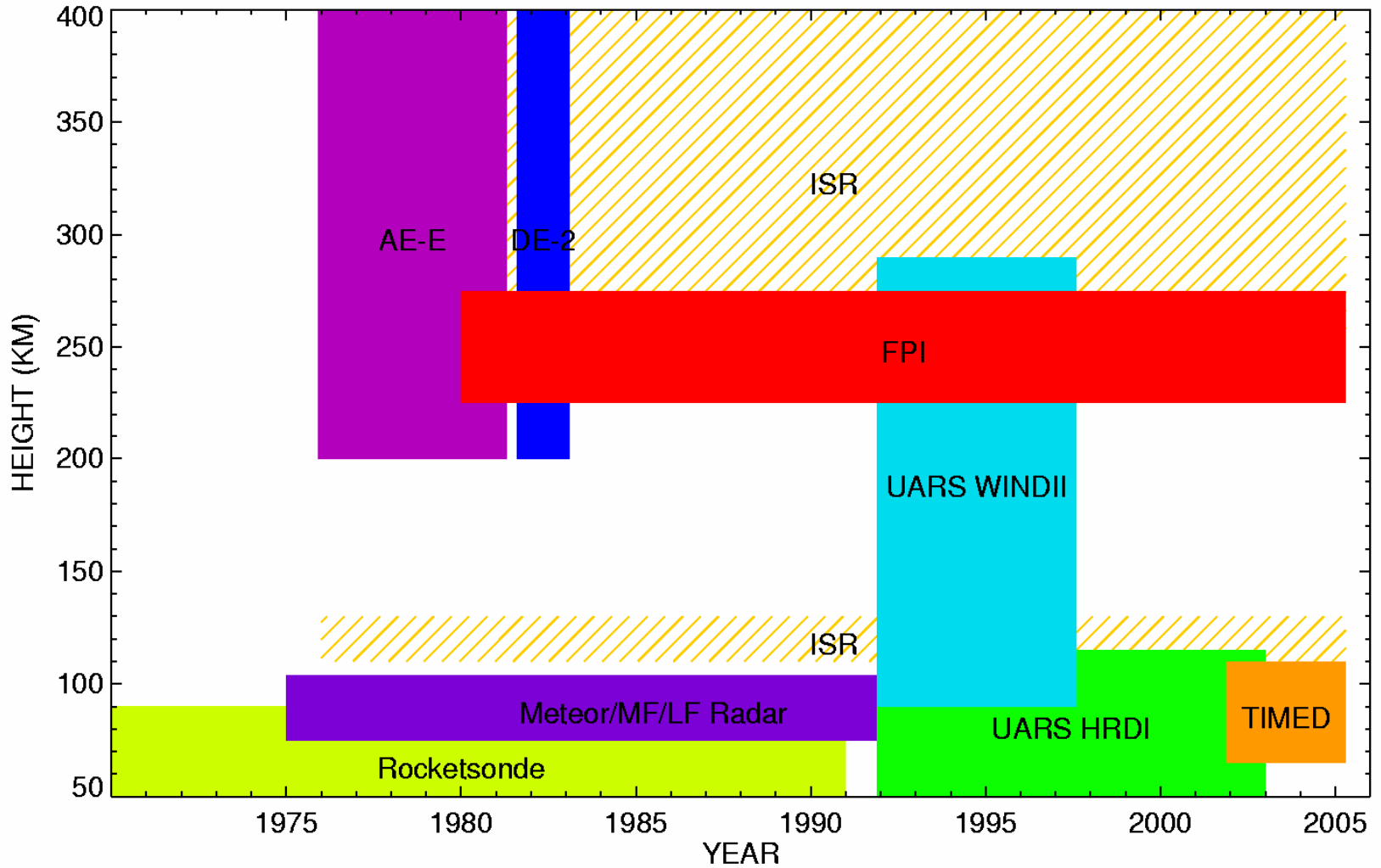
Neutral Wind Techniques - Day
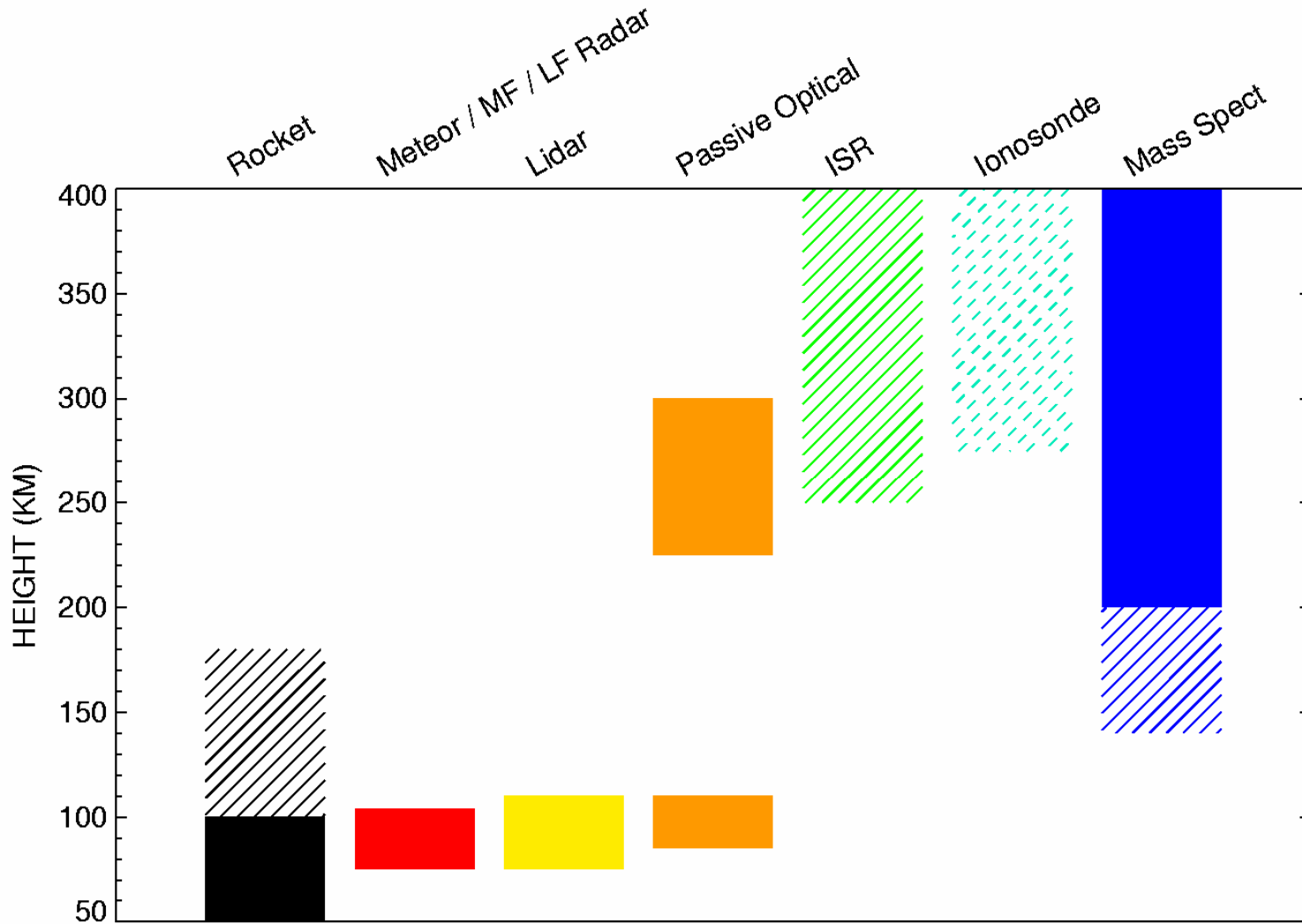
Step 3: next meeting

- The next WG 4.4 meeting, jointly sponsored by CAWSES, will be a Trend Workshop

  Fourth IAGA/ICMA/CAWSES Workshop on Long-Term Changes and Trends in the Atmosphere

  September 4-8, 2006

  Sodankyla Geophysical Observatory, Sodankyla, Finland

  www.sgo.fi/Events/ltt-2006/

CEDAR workshop findings.

A discussion on how a CEDAR aeronomy working group might complement existing long-term trends occurred.

The discussion focused on the idea that since most climatology work is based upon 'average' long term trends then the CEDAR group might consider the variance of these average trends.

An analogy to meteorological weather was made as follows, has the incidence of severe hurricanes over the US increased over the last century? This would be addressed as an increase in the variance of climatology.

CEDAR data sets range from one to two solar cycles and hence are ready for long-term trend analysis.