Summary of session “Precipitating Particle Sources and Particle Transport”
Wednesday 7 October, 2009, 09:00-10:35
by E. Turunen

0830-0900 **Richard Mewaldt**: Solar and Galactic Sources of Precipitating Particles *(Tutorial)*
0900 to 1035: *Precipitating Particle Sources and Particle Transport*
0900-0920 **Gang Lu** (Invited): Sources of Energetic Particles and Their Impact on the Upper Atmosphere
0920-0935 **Max Comess**: Duskside Relativistic Electron Precipitation in the SAMPEX data set from 1992-2004
0935-0950 **Jörg-Micha Jahn**: Emission of ENAs from upper-atmospheric altitudes at the geomagnetic footpoints of hot magnetospheric plasma source regions
0950-1005 **Craig Rodger**: Use of POES SEM-2 observations to examine radiation belt dynamics and energetic electron precipitation into the atmosphere
1005-1020 **Barbara Emery**: Solar Forcing of Electron and Ion Auroral Inputs
1020-1035 **Patrick Newell**: Diffuse, Monoenergetic, Broadband (wave) and Ion Aurora

Tutorial by Richard Mewaldt:
-some notes: heavy nuclei do not penetrate as deep as H and He
-solar modulation change of GCR: We have the highest cosmic ray intensities of the space age during the last 6 months!
-Energy content: H 75%, He 15%, Z>2: 5 %, electrons 5 %

G. Lu:
- TIME-GCM, source distributions and impact of energetic particles
- Distributions of auroral electrons and MEPED electrons very different, as well as MEPED protons
- energy flux and and mean energy have very different peak spatial distributions over globe
- GOMOS NO2 production by rela

M. Comess:
- SAMPEX data
- importance of DREP, REM and band precipitation
- “Botany” problem

J-M Jahn / by P. Valek:
- TWIN Stereo images (2 wide-angle imaging neutral atom spectrometers)
- ion precipitation -> ENA, ENA emission cones
- :-(only weak storms Jun 2008 - Jun 2009
- on 11 Oct 2008 TWINS -DMSP comparison OK
- Halloween storms 2003 show low altitude emissions
- emission of ENAs from low altitudes is correlated with DST

- maximum ENA during storm main phase

C. Rodger:
- examining the use of POES database
- concerns about contamination (even up to 50% of e>300keV?), BUT at the same time some contaminated channels provide a measurement of another parameter!
- clear energy-dependent time delays from solar wind driver to electron precipitation, between 1-7 days depending on energy
- we need abetter quality understanding for energies above 20 keV

B. Emery:
- NOAA and DMSP satellites from 1978
- contribution of solar wind structures: 25% transients, 49% High-speed streams, 32% slow speed, but HSS determine the characteristics of the total Vsw and Pe (total auroral electron power or total of NH and SH from <20 keV)
- strong 9, 13.5, 27 day features in 2005-2008. Generally, largest periodicities in the descending and minimum phases of the solar cycle. Periodicities in Vsw are mimiced in Pe and Pi. For 2008, 9-day periodicities were 30% in Vsw and 40% in Pe and Pi. These 9-day periodicities were also seen in Kp, abs(Bt), and in the CHAMP neutral densities at 400 km, and were not present in the SEE EUV flux.
- Strong semi-annual variations in Vsw (20%) and Pe (40%) found in 1996

P. Newell:
- different types of auroral precipitation
- new precipitation model available <- each precipitation type has a different solar wind driver, monoenergetic auroral precipitation has a strong seasonal dependence
- contact P. Newell