ISSI Workshop 2007

Planetary Atmospheric Electricity

N2 Workshop, 20-23 August, Helsinki

WS General Theme

Planetary Atmospheric Electricity on the solar system planetary objects: Generation and characteristics of electrostatic discharges in the solar system - Their role in the global electric atmospheric circuit

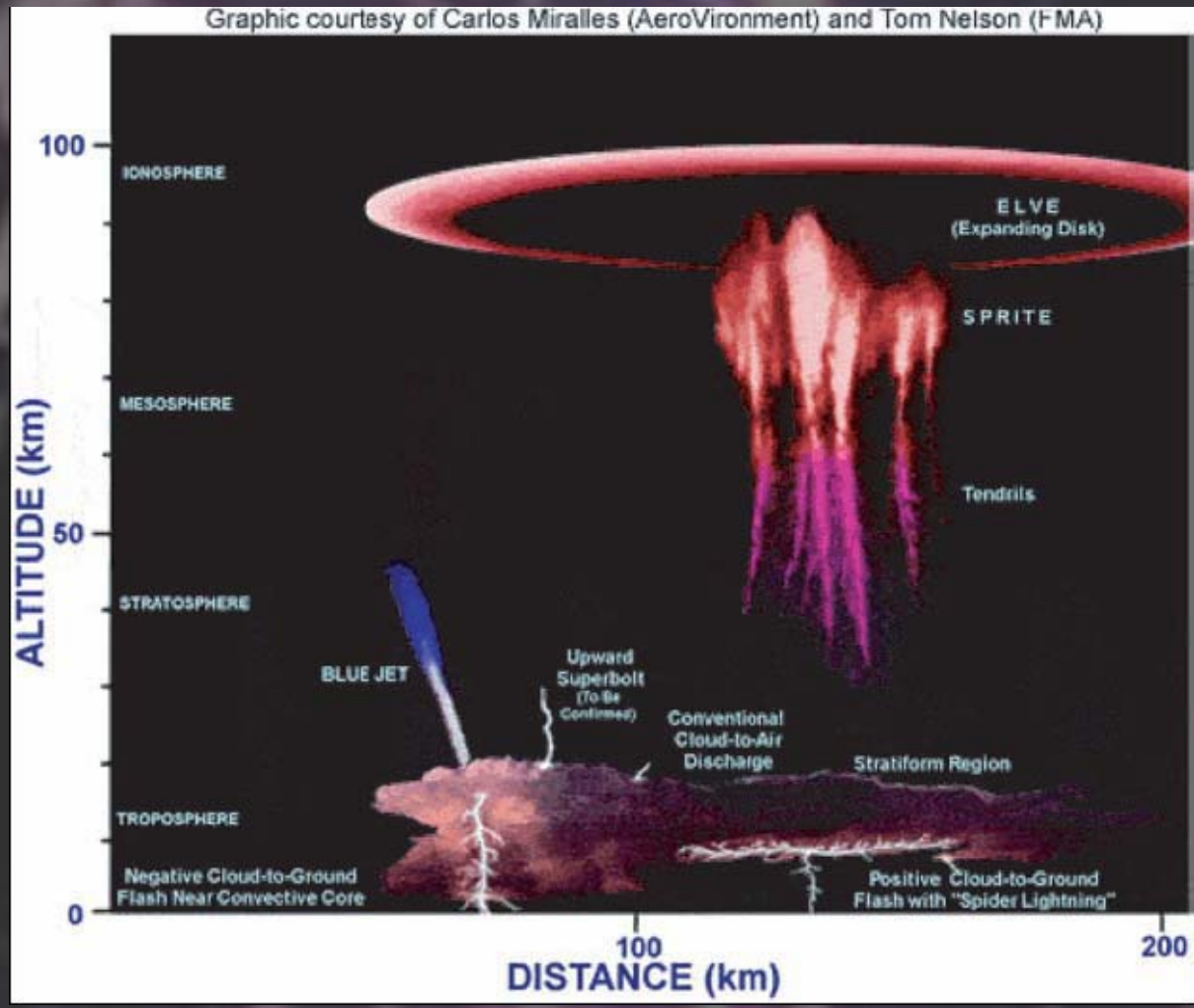
What can be learned from our understanding of the Earth case?

Topics

Review of the lightning on the solar system planetary objects:

- detected : the Earth, Jupiter, Saturn, Uranus
- to be confirmed : Neptune, Venus
- non-detected : Mars, Titan

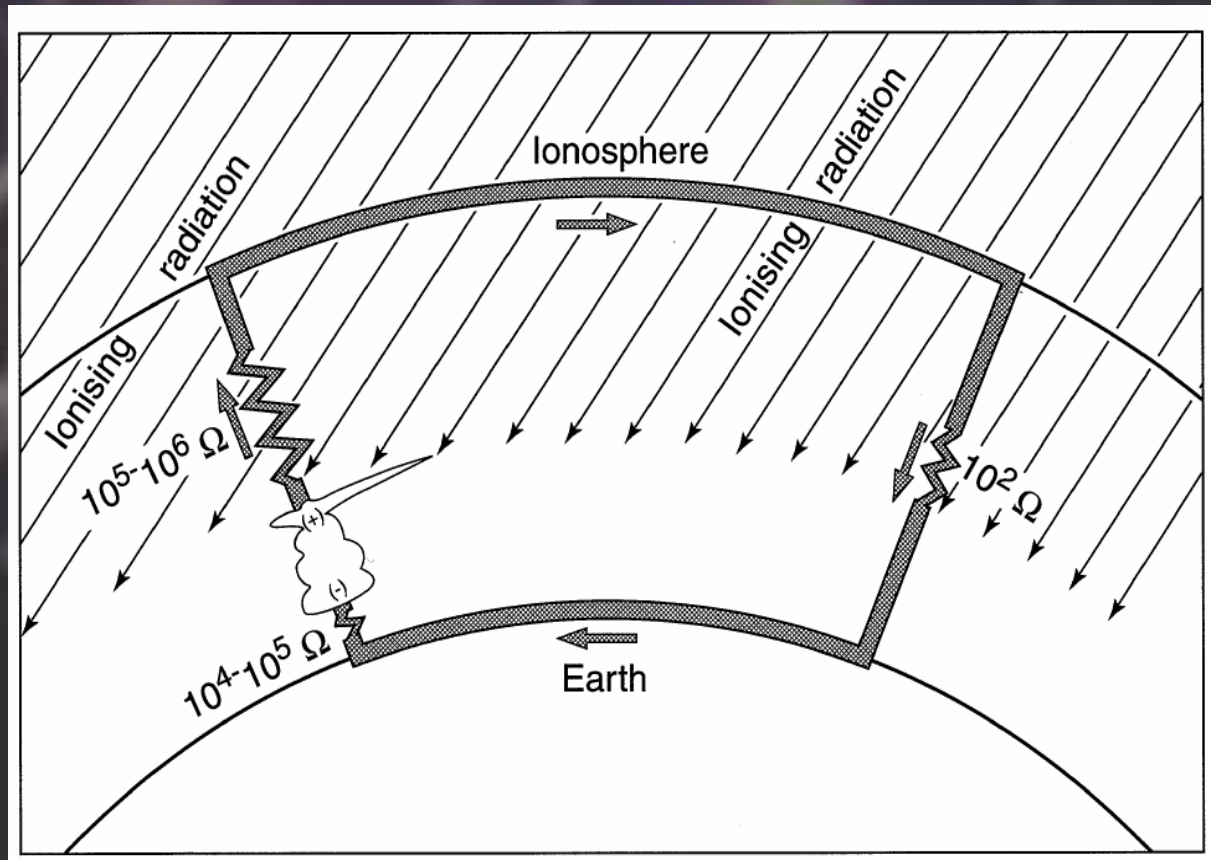
and others?



Topics (cont'd)

Earth Global electric circuit

- Understanding of the electric general circuit of solar system planet



- Role of the cosmic ray, magnetospheric electrons and surface radioactivity

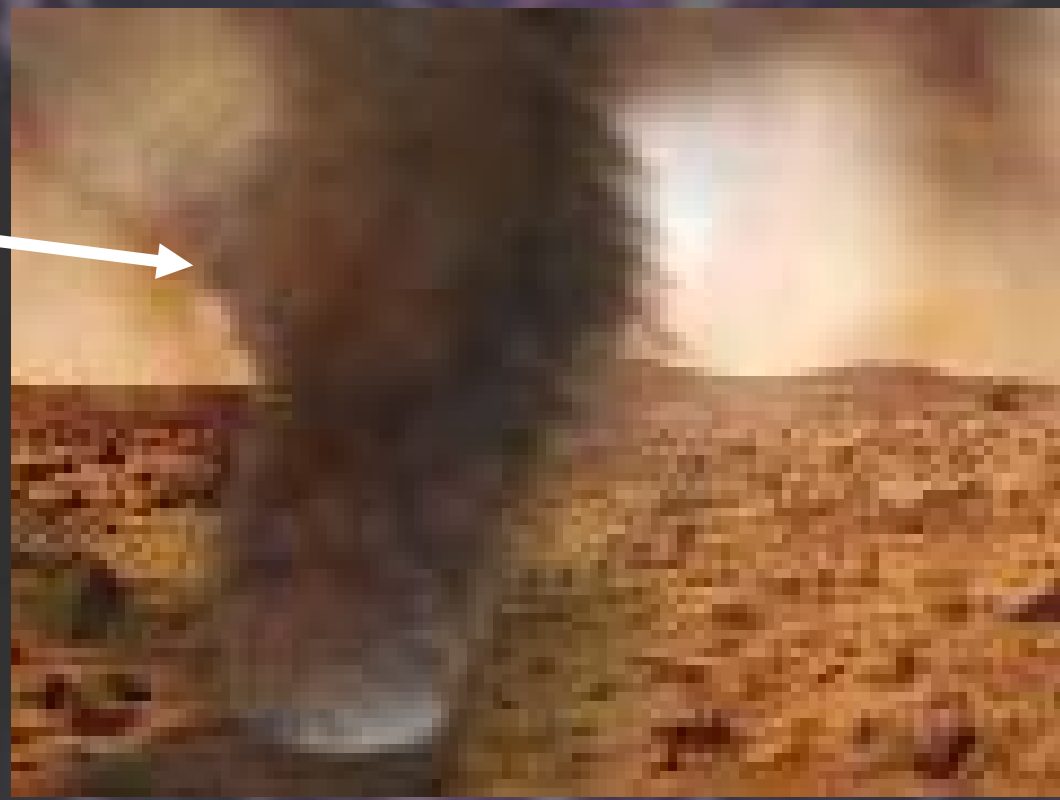
Topics (cont'd)

- Formation of large electric field by charge separation - inductive or non-inductive charge transfer in the

Earth thunderstorms,

Mars dust charging,

Titan charging by absorption of free charge...



Topics (cont'd)

- Convection pattern leading to large electric field (signature of atmospheric dynamics...)
- Potential breakdown (dependency with respect to pressure and composition...)
- Induced chemistry (production of non-equilibrium trace organic constituents, Titan HCN production...)
- Influence of the lightning on the magnetosphere

Topics (cont'd)

- Electromagnetic waves (optical emissions, high frequency radio emission, very low frequency plasma waves...)

- Ground based observations (LOFAR...) and Future space mission (Taranis...)

Low Frequency ARray LOFAR

Timeliness and relevance to space science

- Recent Huygens mission highlights the possibility of lightning in Titan atmosphere
- Venus Express may also address this question

- A review on the main questions related to atmospheric electrification should also support the future Earth mission like Taranis (CNES)

Scientific Relevance

- Knowledge (models, observations) of the atmospheric planetary electrification of numerous solar system objects makes comparative studies very desirable and compelling

- The workshop will also highlight outstanding problems and areas in which progress remains to be made

WS Date & Structure

- Early 2007
- 4.5 days, 4 talks/half day, plenary sessions, no splinter sessions, no working groups

Convenors

- Lebreton J.P. (Netherlands)
- Aplin K. (U.K.)

(Terrestrial atmospheric electricity)

- Pulinets S. (Russia)

(Demeter)

- Parrot M. (France)

(Earthquakes related EM phenomena)

- Kamogawa M. (Japan)

(Earthquake light, ball lightning)

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東京学芸大学
Tokyo Gakugei University

- Harrison R.G. (U.K.)
(Earth atmospheric electricity)

- Klos Zbigniew (Poland)

- Treuman R. (Germany)

- Blanc M. (France)

- *Neubert T. (Denmark)*
(Specialist of Sprites) *To be confirmed*

- *Molina-Cuberos G.S. (Spain)* *To be confirmed*

- *Borucki W.J. (USA)* *To be confirmed*

K. Aplin (k.l.aplin@rl.ac.uk)
S. K. Atreya (atreya@umich.edu)
J.J. Berthelier (jean-jacques.berthelier@cetp.ipsl.fr)
E. Blanc (elisabeth.blanc@cea.fr)
W.J.Borucki william.j.borucki@nasa.gov
G. Delory (gdelory@ssl.berkeley.edu)
S. J. Desch (desch@dtm.ciw.edu)
W. Farrell (william.farrell@gsfc.nasa.gov)
S.G. Gibbard (sgibbard@beowulf.llnl.gov)
D.A.Gurnett (donald.gurnett@uiowa.edu)
R.G Harrisson. (r.g.harrison@reading.ac.uk)
J.P. Lebreton (jean-pierre.lebreton@rssd.esa.int)
F. Leveufre (lefeuvre@cnrs-orleans.fr)
M. Parrot (mparrot@cnrs-orleans.fr)
M.J.Rycroft (michael.j.rycroft@ukgateway.net)
Saunders C.T.R.
Sentman D.D.
T. Tokano (tokano@geo.Uni-Koeln.de)
Wescott E.M.
P. Zarka (philippe.zarka@obspm.fr)
Fernando Simoes (fernando.simoes@cetp.ipsl.fr)

Preliminary list of potential participants (up to ~40)