Geophysical Research Abstracts
Vol. 15, EGU2013-2793, 2013
EGU General Assembly 2013

Modeling the Earth aurora red line linear polarization and comparison with experiments

Véronique Bommier (1), Jean Lilensten (2), and Mathieu Barthélemy (2)

(1) Observatoire de Paris, CNRS-LESIA, Meudon, France (v.bommier@obspm.fr), (2) IPAG, Université Joseph Fourier, Grenoble, France (jean.lilensten@obs.ujf-grenoble.fr, mathieu.barthelemy@obs.ujf-grenoble.fr)

Using the recent theory of impact polarization for a forbidden line like the O I 6300 Å line of the Earth auroræ (Bommier et al., 2011, Ann. Geophys., 29, 71), we have computed the aurora emerging polarization as a function of the observed height, by solving the statistical equilibrium of the population and alignment of the line upper level, submitted to all the contributing processes (electron impact, dissociative recombination of O_2^+ with electron, photodissociation of O_2, radiative cascades from upper levels, reaction $N(^2D)+O_2$). In particular, the angular and energetic distribution of the impacting electrons was detailed in the TRANSSOLO outputs and entered in the modeling. We compare the theoretical results to data obtained during a coordinated experimental campaign joining the Eiscat Svalbard Radar and a spectro-photopolarimeter in February 2012.

This work is supported by the ESPAS FP7 project.