

Final project report

Project ID	2002/7.2
Title	Greenlandic station for auroral observations
Principal investigator	Stefano Massetti
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Duration	2 years
Assigned funding	7.760,00 €

Activities and results

A permanent observatory was installed on the North-East coast of Greenland (74°18'26"N , 20°13'00"E), and equipped with an *all-sky camera* that automatically records the auroral activity in the three most intense wavelengths: 437.8, 557.7 and 630.0nm (blue, green and red, respectively). The station was equipped with an Inmarsat-B satellite phone, to allow the remote control of the instrument and to download data samples. Due to the limitation of the bandwidth, the dataset acquired during the winter season (October-March), is manually recovered in summer: in that occasion, a careful inspection of the equipment is regularly performed, the *all-sky camera* is dismounted, cleaned, tested and left ready for the next winter season. The overall functionality of the station is performed, too. The main goal of this station, named ITACA-DNB, is to provide joint high-latitude auroral observations together with its twin ITACA-NAL, located on the Svalbard. ITACA-DNB is actually the only permanent auroral observatory on the North-East Greenland. Thanks to their strategic location, both station can observe the so-called *dayside auroras*, which are produced by the direct precipitation of the solar-wind plasma into the geomagnetic cusp(s). The dayside auroral activity is then directly driven by the interplanetary conditions, and its study allows inspecting the Sun-Earth relationship, via the magnetic reconnection process and viscous-like mechanisms (as the Kelvin-Helmholtz instability). Thanks to an agreement between INAF-IFSI (Roma, Italy) and FMI/Space (Helsinki, Finland), both stations participate to the international network MIRACLE (<http://www.ava.fmi.fi/MIRACLE/index.html>). Data are hence shared with the international community and used in multi-instrument (both ground- and space-based) studies.

Products

A – papers in scientific magazines

1. Massetti S., S. Orsini, M. Candidi and K. Kauristie: *Dayside pulsed aurora intensifications, observed by ITACA during constant IMF Bz ~ 0 and By << 0*, JGR, 107, doi:10.1029/2001JA009204, 2002.
2. Safargaleev V., T. Sergienko, H. Nilsson, A. Kozlovsky, S. Massetti, S. Osipenko, A. Kotikov, *Combined optical, EISCAT and magnetic observations of an auroral torch and Ps6 pulsations in the late morning hours: A case study*, Annales Geophysicae, 23, 1821-1835, 2005.
3. Massetti S., *Dayside magnetosphere-ionosphere coupling during IMF clock-angle ~90°: longitudinal cusp bifurcation, quasi-periodic cusp-like auroras and traveling convection vortices*, JGR, 110, doi:2004JA010965, 2005.

B – book chapters

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C - proceedings of international conferences

1. Massetti S., M. Candidi, P. Cerulli-Irelli, R. Sparapani, M. Maggiore, H. Philipsen, P. Baldetti, A. Morbidini: *ITACA² - twin 76-ilat auroral monitors*, poster to the EGS-AGU-EUG Joint Assembly, 06-11 April 2003, Nice, France.

Programma Nazionale di Ricerche in Antartide (PNRA)

2. Massetti S., M. Candidi, P. Cerulli-Irelli, S. Orsini: *Wide cusp/llbl ground observations by twin high-latitude auroral monitors*, poster to the EGS-AGU-EUG Joint Assembly, 06-11 April 2003, Nice, France.
3. Massetti S., and M. Candidi: *Recurrent dayside auroral events during large IMF B_y and near zero B_z conditions*, poster to the 7th International Conference on Substorms ICS7, 21-27 March, Kittila (Levi), Finland, 2004.

D – proceedings of national meetings and conferences

1. Massetti S., M. Candidi, P. Cerulli-Irelli, S. Orsini: *Studio dell'attività aurorale ad alta latitudine e le relazioni Sole-Terra*, poster to the Progetto Strategico Artico: Inquadramento e Prospettive, 18 Dicembre, Roma, 2002.

E – thematic maps

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F – patents, prototypes and data bases

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G – exhibits, organization of conferences, editing and similar

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H - formation (PhD thesis, research fellowships, etc.)

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Research units

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Compito di ricerca: Responsabile progetto osservazioni congiunte Groenlandia-Svalbard

Elenco di ricercatori dell'Unità di ricerca/

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Notes