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Measuring the mesoscale neutral wind variability near auroral arcs using Fabry-Perot Interferometer (FPI).

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Fabry-Perot Interferometers (FPIs) measure the Doppler shift and broadening of the green-line emission from which neutral velocities and temperatures can be derived respectively. The Scanning Doppler Imager (SDI) which is an all sky version of the FPI measures the neutral winds. SDIs are currently located in Alaska, Antarctica and Svalbard Island. This study investigates the E region neutral wind response to the driving force caused by the enhanced electric field upon the occurrence of an aurora. Subsequently, it is intended to study the ion-neutral coupling in the E layer focussing on energy dissipation in the form of Joule heating. Other scientific goals that can be achieved from knowing thermospheric neutral wind velocity include studying the geomagnetic effects on the neutral wind and temperature, direct observation of gravity waves originating in the thermosphere and comparing ion drift measurements. The main scientific thrust is to expand our knowledge on the interaction of neutral thermospheric winds and temperatures with auroral arcs from an initial single publication [Kosch et al., 2010] using existing SDI data from McMurdo and South Pole (projects 1 and 2). The Super Dual Auroral Radar Network (SuperDARN) data set is used as a source of ion velocities to estimate the electric field.

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Professor Michael Kosch
SANSA
mkosch@sansa.org.za

Primary author: Mr NGWANE, Ntlakanipho (SANSA/UKZN)

Co-authors: Prof. KOSCH, Michael (SANSa); Dr MTUMELA, Zolile (UKZN)

Presenter: Mr NGWANE, Ntlakanipho (SANSa/UKZN)

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