Initial Observations of the Magnetic Field Measurements on the C/NOFS Satellite

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The Vector Electric Field Instrument (VEFI) suite onboard the C/NOFS spacecraft includes a sensitive fluxgate magnetometer to measure DC and ULF magnetic fields in the low latitude ionosphere. The instrument includes a DC vector measurement at 1 sample/sec with a range of ± 45,000 nT whose primary objective is to enable a **V** x **B** measurement that is more accurate than that provided by using a magnetic field model. These data will also be used to provide signatures of large-scale ionospheric current systems, which, when analyzed in conjunction with the C/NOFS DC electric field measurements, promise to advance our understanding of equatorial electrodynamics. The instrument also includes an AC-coupled vector measurement in the 0.05 – 8 Hz frequency range at 16 samples/sec with an output range of ± 900 nT in order to measure small-scale current filaments and possible Alfven waves associated with plasma irregularities. We compare the Earth's magnetic field models such as the most recently updated IGRF (the International Geomagnetic Reference Field) model and the POMME (the POtsdam Magnetic Model of the Earth) model with the measurements in order to provide an in-flight "calibration" of the data as well as compute magnetic field differences to reveal large scale ionospheric currents. Our initial results show that, on average, the POMME model accurately reproduces the C/NOFS-measured magnetic field within 20 nT in magnitude and within 0.1 deg in field direction everywhere in the low latitude ionosphere except in the region of the South Atlantic Anomaly. Initial results of the C/NOFS magnetic field measurements will be shown.