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Large high-latitude wintertime NOx enhancements at high altitude detected by ACE/MAESTRO in 2003-4

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Abstract: Spectrophotometric measurements made from low-earth orbit are presented which show highly elevated nitrogen dioxide mixing ratios in the 50 to 70 km altitude range during the winter of 2003-4. These high levels persisted from the time the instrument was first turned on in late February, 2004 until May, 2004. The measurements were made by an instrument named MAESTRO (Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation) which was launched on August 12, 2003, on board the Canadian Space Agency's SciSat-1 together with a Fourier transform spectrometer (ACE-FTS) to conduct a study of Arctic, wintertime ozone layer chemistry. MAESTRO is a dual, diode-array spectrophotometer which measures from the ultraviolet ($\sim$270 nm) to the near infra-red ($\sim$1040 nm). The spectrometers are equipped with a unique two-port fore-optics arrangement which allows the instrument to make both atmospheric backscatter observations and measurements of the sun in occultation.