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The Canadian Arctic Atmospheric Chemistry Experiment Validation Project: Recent results and overview

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In order to fully understand the mechanisms and processes which result in polar stratospheric ozone depletion, high quality measurements of atmospheric trace gases are essential. Ground-based measurements provide critical data for the validation of satellite retrievals. To this end, seven Canadian Arctic Atmospheric Chemistry Experiment (ACE) satellite validation campaigns have been conducted during the spring period (February - April in 2004 - 2010) at the Polar Environment Atmospheric Research Laboratory (PEARL) in Eureka, Nunavut (80°N, 86°W). This period coincides with the most chemically active time of year in the Arctic, as well as a significant number of satellite overpasses. A suite of as many as 12 ground-based instruments, as well as frequent balloon-borne ozonesonde and radiosonde launches, have been used in each campaign. These instruments include: a ground-based version of the ACE-FTS (PARIS - Portable Atmospheric Research Interferometric Spectrometer), a terrestrial version of the ACE-MAESTRO, a SunPhotoSpectrometer, two zenith-viewing UV-visible grating spectrometers, a Bomem DA8 Fourier transform spectrometer, a Bruker 125HR Fourier transform spectrometer, a Systeme d'Analyse par Observations Zenithales (SAOZ) instrument, a Differential Absorption Lidar and several Brewer spectrophotometers. This presentation will focus on an overview of the measurements made by the ground-based, balloon-borne and satellite-borne instruments during the 2007-2009 ACE Arctic Validation campaigns. Preliminary results from the 2010 campaign will also be discussed.