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# NORTH ATLANTIC AEROSOL PROPERTIES FOR RADIATIVE IMPACT ASSESSMENTS, DERIVED FROM COLUMN CLOSURE ANALYSES IN TARFOX AND ACE 2

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Aerosol effects on atmospheric radiative fluxes provide a forcing function that can change the climate in potentially significant ways. This aerosol radiative forcing is a major source of uncertainty in understanding the climate change of the past century and predicting future climate. To help reduce this uncertainty, the 1996 Tropospheric Aerosol Radiative Forcing Observational Experiment (TARFOX) and the 1997 Aerosol Characterization Experiment (ACE-2) measured the properties and radiative effects of aerosols over the Atlantic Ocean. Both experiments used remote and in situ measurements from aircraft and the surface, coordinated with overpasses by a variety of satellite radiometers. TARFOX focused on the urban-industrial haze plume flowing from the United States over the western Atlantic, whereas ACE-2 studied aerosols over the eastern Atlantic from both Europe and Africa. These aerosols often have a marked impact on satellite-measured radiances. However, accurate derivation of flux changes, or radiative forcing, from the satellite-measured radiances or retrieved aerosol optical depths (AODs) remains a difficult challenge. Here we summarize key initial results from TARFOX and ACE-2, with a focus on closure analyses that yield aerosol microphysical models for use in improved assessments of flux changes. We show how one such model gives computed radiative flux sensitivities (dF/dAOD) that agree with values measured in TARFOX and preliminary values computed for the polluted marine boundary layer in ACE-2. A companion paper (Bergstrom and Russell, this conference) uses the model to compute aerosol-induced flux changes over the North Atlantic from AVHRR-derived AOD fields.