

Eric Jensen – Abstract

Constraining Upper Troposphere/Lower Stratosphere Aerosol Physical Processes with High-Altitude Aircraft Measurements

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Interest in a more complete understanding of the sources, composition and microphysics of stratospheric aerosol particles has intensified during recent years for several reasons: (1) small volcanic eruptions have been recognized as a driver of short-term changes in climate forcing; (2) emissions of sulfur dioxide (SO₂) and other aerosol precursors have shifted to south Asia and other low latitude regions with intense vertical transport; (3) organic material has been recognized as a key contributor to lower stratospheric aerosol mass; and (4) interest in possible solar radiation management (geoengineering) through significant enhancements in stratospheric aerosols has intensified.

To address stratospheric aerosol science issues, we are proposing a NASA Earth Ventures mission to NASA to provide extensive high-altitude aircraft measurements of critical gas-phase and aerosol properties at multiple locations across the planet. In this presentation, we will discuss the objectives of the proposed campaign, the measurements provided, the sampling strategy, and the modeling and analysis approaches that would be used to address specific science questions.