

The unique role of airborne in situ observations in identifying and characterizing stratosphere-troposphere exchange (STE)

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\*Pan Laura<sup>1</sup>

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1. National Center for Atmospheric Research

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*In situ* observations play a unique role in characterizing the linkage between dynamical processes of all scales and atmospheric composition. Many of these processes are not resolved by satellite observations, and their representations in global chemical climate models are yet to be examined. In this talk, I will present a set of examples using the data from some recent airborne campaigns, including those over the continental US and in the tropics. The examples focus on observations in the upper troposphere and lower stratosphere from high-flying research aircraft NCAR Gulfstream V (GV), NASA DC-8, ER-2 and the Global Hawk.