

***CLOUD, DRIZZLE, AND TURBULENCE OBSERVATIONS IN MARINE  
STRATOCUMULUS CLOUDS IN THE AZORES***

Jasmine Rémillard, *McGill University*  
Pavlos Kollias, *McGill University*  
Edward Luke, *Brookhaven National Laboratory*

For presentation at  
The Second Science Team Meeting of the  
Atmospheric System Research (ASR) Program,  
San Antonio, TX  
March 28-April 1, 2011

**Environmental Sciences Department/Atmospheric Sciences Division  
Brookhaven National Laboratory**

**U.S. Department of Energy**

**Office of Science**

**ABSTRACT**

The recent deployment of the AMF at the Azores provided a unique, long-term record (May 2009 to December 2010) of cloud observations in a regime dominated by low-level stratiform clouds. First, a comprehensive cloud classification scheme that utilizes the radar, lidar, and thermodynamic observations is applied to determine the occurrence of different cloud types (e.g., stratus, cumulus, cirrus) and precipitation (e.g., shallow and deep) over the 20-month long data set to identify stratocumulus periods. Around 30 days dominated by stratocumulus clouds were selected for the analysis. A diurnal cycle was obtained for the cloud and drizzle occurrences, as well as their depth. The strength of the drizzle is further studied in conjunction with various other parameters. For instance, the LWP correlates well with the occurrence of drizzle, with the highest values of LWP found in heavier drizzle events. Also, the effects of the stability and adiabaticity of the cloud layer, as well as the presence of decoupling in the sub-cloud layer on the drizzle production and strength are studied. The mass flux from up and downdrafts are assessed from the cloud radar velocity measurements.

---

**NOTICE:** This manuscript has been authored by employees of Brookhaven Science Associates, LLC under Contract No. DE-AC02-98CH10886 with the U.S. Department of Energy. The publisher by accepting the manuscript for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.