



The Turbulence Structure within a Thermally Stratified Pine Forest

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Canopy turbulence is the main driving force for biosphere-atmosphere exchanges of momentum, heat, and mass (e.g., CO₂, H₂O, CH₄). The purpose of this study is to investigate the structure of canopy turbulence under different atmospheric thermal stabilities. In this study, thermal stability profile is described by local heat flux measurements in order to quantify its effect on the turbulence statistics.

The field experiment was carried out at a uniform 14 m tall Pine forest. Based on the experimental measurements and analysis, we have found the following: 1) the canopy thermal stability varies with height and time, and can not just be described by the stability measured at the canopy top; 2) the canopy turbulence structure varies with thermal stability; 3) thermal stability has limited impact on lower-order turbulence statistics (e.g., standard deviation) but has significant effect on higher-order statistics (e.g., skewness, kurtosis).