

Measuring Isoprene Emissions over a Temperate Deciduous Forest using a True Eddy Accumulation System

Takuya Saito

National Institute for Environmental Studies, Japan

Author list (excluding presenting author)

Ayaka Sakabe, Satoru Takanashi

Abstract

Biogenic volatile organic compounds (BVOC) emissions from terrestrial vegetation have significant impacts on tropospheric ozone, oxidation capacity and the formation of secondary organic aerosols. Accurate measurement of BVOC fluxes is crucial for understanding the roles of BVOCs. However, measurements of BVOC emissions are still sparse, partly because of the absence of reliable and affordable instrumentation for measuring flux. In this study, we developed a flux measurement system based on true eddy accumulation (TEA) method. Using fast response mass flow controllers, the TEA system separates updraft and downdraft air samples at sampling flow rates proportional to vertical wind velocities. The segregated samples can be analyzed later by a slow response instrument, such as a thermal desorption unit combined with a gas chromatograph (GC) equipped with a flame ionization detector (FID). For flux measurements of isoprene, the TEA system and the TDU/GC/FID were deployed at a tower site in a temperate deciduous forest in Japan. We present our approach and explore the diurnal and seasonal variability of isoprene emissions.

Early Career Scientist

NO, I am not an early career scientist.