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# The Lake-Atmosphere Turbulent EXchanges (LATEX) field measurement campaign

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Despite its crucial significance for many scientific endeavors such as improving evaporation models and studying the ecological implications of climate change, atmosphere-water interaction has historically received less attention than land-atmosphere exchanges. The Lake-Atmosphere Turbulent EXchanges (LATEX) field measurement campaign was designed to help bridge this gap and address some of the issues listed above. The experiment took place on a platform in Lake Geneva in Switzerland (exposed to a 30 km long wind fetch) over the period extending from August through October of 2006. The primary instrumentation consisted of a vertical array of four sonic anemometers and four open-path H2O/CO2 analyzers, water temperature and velocity profiles, net radiation, water surface temperature, relative humidity and temperature of air, as well as wave height and speed.

We present the diurnal trends of momentum, heat, and water vapor fluxes for the whole experimental period and we test several evaporation models of varying complexity; models based on energy balance are found to perform quite well. The roughness lengths of the surface (for momentum, heat, and water vapor) and their dependence on different parameters such as stability, shear velocity and the state of the wave field are also investigated. We then focus on coherent structures over the lake and perform a quadrant analysis for momentum, heat and water vapor fluxes. Under neutral and stable stratification, we observe that ejections and sweeps contribute equally to

the vertical fluxes; in unstable conditions, ejections begin to clearly dominate.