

Local lake-breeze circulations at high altitude in the Titicaca lake area: on-site and numerical simulations of lake-breeze

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ABSTRACT

The Titicaca Lake is situated at 3812 masl between Bolivia and Peru, it is considered as one of the highest navigable lakes in the world, and its main lake-breeze characteristics, such as, ambient geostrophic wind, atmospheric stability, and surface roughness length were scarcely studied and published. This work aims to study the lake-breeze characteristics and low atmospheric boundary layer (ABL) at high altitude conditions. With this objective, we are using on-site measurements and numerical simulations with the Weather Research and Forecasting (WRF) model to evaluate the main characteristics of lake-breeze around the Titicaca Lake. The measured data shows weak characteristics of valley-mountain winds and inverse vertical wind profile during low wind velocities. Additionally, the highest wind velocities are present during the change from dry to wet season (approximately, 4 months from August until November) of the year.