



## **Numerical Simulation of Summer Local Atmospheric Circulation and Atmospheric Boundary Layer Characteristics over Alpine Lake Namco, Tibetan Plateau**

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**Abstract:** Lake Namco, with an average altitude 4700m, located in the central of Tibetan plateau, plays an important role in local circulation and environment. In this investigation, a set of triple nested numerical simulation tests with and without the lake Namco was conducted by using NCAR nonhydrostatic meso-scale model (MM5V3.7). The characteristics of surface temperature, atmospheric boundary layer height, sensible heat flux and, latent heat flux were analyzed, and the vertical circulation, land-lake breeze were also simulated. The model runs were verified with data from several locations around the Namco area and show reasonable agreement with observations. The main results show: 1. The existence of lake show a strong cold (warm) lake effect to the summer atmospheric boundary layer characteristics over the lake Namco region. 2. Lake Namco has significant day change impact on sensible heat flux and latent heat flux. Both sensible heat flux and latent heat flux is small in day, and the situation is contrary in night. 3. lake Namco makes lake atmospheric boundary layer height lower than the land. 4. The vertical motion is downward over the lake and upward over the land, then the air is dry and cold over the lake; warm and moist over the land. There is the wet air column around lake, which plays a key role in protecting the lake area. 5. 550hpa wind field show a clear lake-land breeze.