

# Effects of Land Use Data and Topographic Radiative Forcing on Surface Winds and Temperature Simulation

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## Abstract

Regional model can provides high resolution information for impact assessment and resource management. High resolution simulation allows us for a more precise description of regional topographic effects, land-sea contrasts and land use vegetation characteristics. Better resolved small-scale processes can have improved large-scale impacts on mesoscale and weather scale processes. Lai et al. (2010) conducted the experiments with high topographic resolution of Taiwan. His results showed that complex terrain may influence on surface solar radiation significantly and higher resolution on topography may lead to distinctive impact on solar radiation near the surface. Therefore, we use high resolution WRF (version 3.3.1) model with Goddard radiation scheme to discuss the topographic effect on surface solar radiation which leads to different results in meteorological field under and weak synoptic condition. Results from simulating 2007/05/09 show that maximum topographic influence on the net clear sky surface radiation during dawn and sunset and minimum terrain effect on clear sky surface radiation during the noon. This may result from the maximum of the sun inclination angle during dawn/sunset and the minimum. Besides, diurnal temporal variation is inversed at the noon because of terrain shading. These results are consistent with Lai et al. (2010). Latent heat flux, and temperature are rather similar simulated results. However, one can see these three variables maximum difference around sunrise and sunset. Thus, we expect positive impact on the simulating results with similar to real topographic data in the future.