Can regional and mesoscale models predict the temperature variation during a solar eclipse?

Masanori Onishi[1]; Isao Iizawa[2]; Hiroyuki Kusaka[3]; Satoshi Sakai[4]; Miki Nakamura[5]; Kei Kobayashi[6]

[1] Human and Environmental Studies,Kyoto Univ; [2] Kyoto Municipal Horikawa High School; [3] Life and Environmental Sciences, Univ. of Tsukuba; [4] Human and Environ. ,Kyoto Univ; [5] Human and Environ,Kyoto Univ.; [6] Jinkan,Kyoto Univ.

For urban meteorology, urban heat island for example, heat budget of land surface is important. The heat budget depends on the balance between solar radiation, infrared radiation, sensible heat, latent heat and heat into the ground. Thermal inertia of the ground is one of the important parameters. The thermal inertia of the ground is the value that is determined by the relationship between the fluctuation of solar radiation into the ground and temperature variation of the ground. The thermal inertia has been observed by temperature difference between day and night. The temperature difference between day and night, however, depends on not only the fluctuation of solar radiation but also other factors, temperature relaxation caused by advection for example. To estimate the thermal inertia of the ground that is not affected by advection, Iizawa et al. observed temperature variation caused by the fluctuation of infrared radiation depends on the presence or absence of cloud and they estimated Local Effective Thermal Inertia (LETI). The value of LETI indicates that the thermal inertia observed by temperature difference between day and night is affected by advection and is overestimated at a rural area and underestimated at an urban for regional and mesoscale models which make prediction of the local weather. In this study we have the idea that the temperature variation during a solar eclipse shows whether the thermal inertia for models is overestimated or underestimated or not.