Pereira Filho, A. J., F. Vemado, K. Saito, H. Seko, J. L. Flores Rojas, and H. A. Karam, 2018: ARPS simulations of convection during TOMACS. *J. Meteor. Soc. Japan*, **96A**, 247-263. https://doi.org/10.2151/jmsj.2018-030

High spatiotemporal resolution datasets of the Tokyo Metropolitan Area Convection Study (TOMACS) were used to analyze three episodes of summer deep convection in the Tokyo Metropolitan Area (TMA) under heat island and sea breeze effects. They were simulated with (and without) the tropical town energy budget (T-TEB) model coupled to the advanced regional prediction system (ARPS).

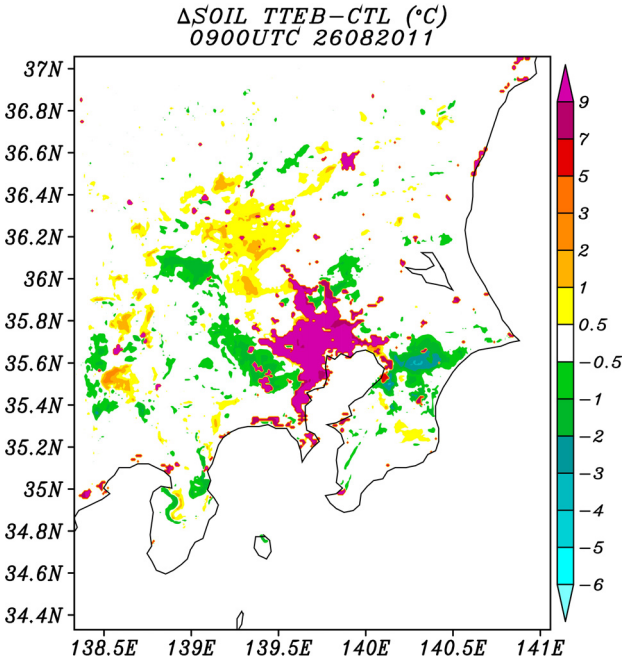

Figure 1: Diference of ARPS soil temperature simulations with and without T-TEB (control).

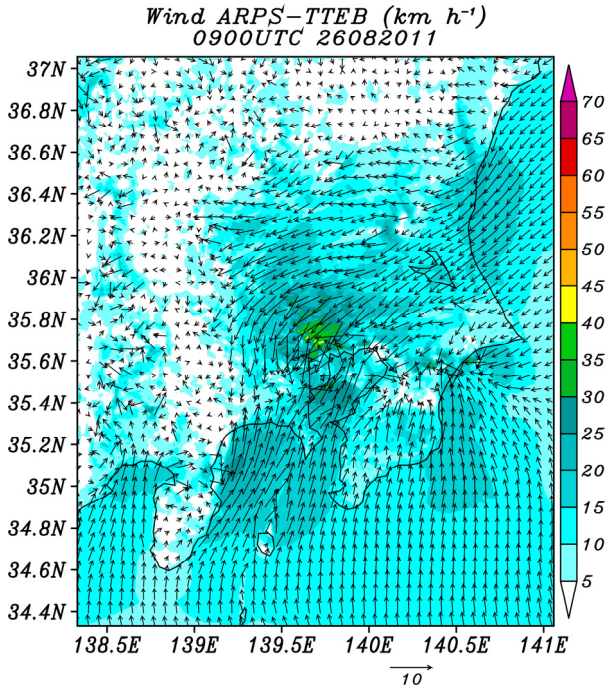

Figure 2: Surface winds in TMA simulated with the T-TEB/ARPS system at 1-km resoltion.

- Deep convection over TMA is induced by the heat island (Fig. 1) and sea breeze (Fig. 2) during weak synoptic forcing simulated with the ARPS/T-TEB system and JMA global model inputs.
- The ARPS/T-TEB simulations of three deep convection episodes are similar to previous studies.
- Dissipation (phase) errors on hourly precipitation forecasts tend to dominate, though scores improved up to 300% within the advective time scale with JMA boundary and initial conditions.
- The goal of the study was to test the T-TEB scheme, recently implemented in the ARPS system.
- The T-TEB includes momentum transfer by buildings and constructions.
- Similar ARPS simulations for the Metropolitan Area of São Paulo (MASP) also include wind acceleration by buildings and structures.