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ILS+Urban: an offline land-surface process model for global urban climate and energy simulations

Yuya Takane^{1,2}, Tomoko Nitta³, Sachiho A. Adachi⁴, Kei Yoshimura³, Masuo Nakano⁵, Makoto Nakayoshi², Shiho Onomura², and Ben Crawford⁶

¹National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan (takane.yuya@aist.go.jp)

²Tokyo University of Science

³The University of Tokyo

⁴RIKEN

⁵Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

⁶University of Colorado, Denver

We have developed ILS+Urban: a coupled model of an offline land-surface model (ILS) and an urban canopy and building energy model (SLUCM+BEM) for global urban climate and energy research. The ILS is an offline land-surface model that includes MATSIRO, a land-surface model for the global climate model MIROC5. The SLUCM+BEM is a new parametrisation for urban climate and energy simulations developed by the authors, which can simply simulate anthropogenic heat from buildings (QFB) and electricity consumption (EC) from human activities. We have implemented the SLUCM+BEM in the ILS, which allows us to simulate global urban climate and energy with relatively low computational resources in offline mode. A test simulation of ILS+Urban shows that QFB and EC tend to be quantitatively high throughout the year in the Middle East, for example. In the near future, we will implement a global urban database (e.g. global LCZ, anthropogenic heat emissions and morphology) and new technology parameterisations (e.g. EV, PV and heat pump water heaters) for global urban climate and energy projections and countermeasures for urban heat and energy savings & generation. In addition, the ILS+Urban will be coupled with global climate models (e.g. MIROC and NICAM).