Oizumi, T., K. Saito, L. Duc, and J. Ito, 2020: Ultra-high resolution numerical weather prediction with a large domain using the K computer. Part 2: The case of the Hiroshima heavy rainfall event on August 2014 and dependency of simulated convective cells on model resolutions. *J. Meteor. Soc. Japan*, **98**, 1163-1182. https://doi.org/10.2151/jmsj.2020-060.

Plain Language Summary: This study conducts the Ultra-high-resolution (5-km to 250-m grid spacing) numerical weather prediction (NWP) experiments and investigates the impacts of model resolutions on the Hiroshima heavy rain event in August 2014. The results show that the finer resolution model well reproduces the torrential rain event and the simulated convective cores (CCs) tend to converge when the resolution goes beyond 500 m.

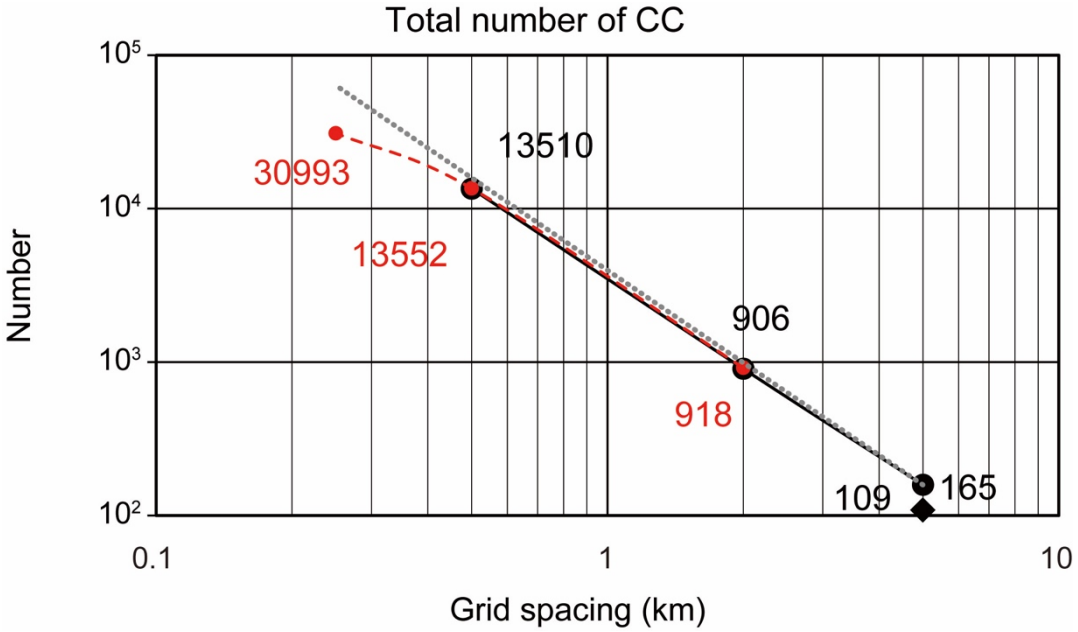

Fig. 1. Dependency of the number of CCs on the model resolution in the logarithm scales. While the solid line connects the average numbers of CCs simulated by CM5kmMY, CM2kmMY, and CM500mMY, the dashed line connects those simulated by CM2kmDD, CM500mDD, and CM250mDD. The separate diamond symbol indicates that simulated by KF5kmMY. The dotted gray line indicates an increase in the CCs against the model grid spacing crossing at the point of CM5kmMY as a reference. (KF: Kain–Fritsch scheme, CM: cumulus parameterization, MY: Mellor–Yamada–Nakanishi–Niino level 3 scheme, DD: Deardorff scheme)

- The local rate of change of the number of CCs with respect to the model resolution was found to start decreasing at very high resolutions of around 500-m grid spacing.
- This implies that the number of CCs tends to converge when the resolution goes beyond 500 m.