

**P-02**

**Generation of AI-based proxy radar data from GK2A/AMI data in East  
Asia**

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KMA is conducting research on the development of satellite products using various artificial intelligence (AI) techniques. In this study, we developed an AI-based proxy radar data generation technique using Geo-Kompsat-2A (GK2A) satellite observation data. This aims to produce high-quality proxy radar data for the East China Sea, which is an important area for monitoring severe weather conditions on the Korean Peninsula, and utilize it for filling radar observation gaps and pre-emptive response to hazardous weather conditions. As an AI model structure, an image-to-image translation technique called Pix2PixCC which is based on a conditional Generative Adversarial Network (cGAN) was used. Pix2PixCC is a type of cGAN that improves the performance of each model through mutual constraint learning between the generator and discriminator, and it is derived from the Pix2Pix (Isola et al., 2017) and Pix2PixHD (Wang et al., 2018). The Pix2PixCC technique is modified by adding an Inspector, which applies the correlation coefficient between real and generated images as a loss function to the model training. We used satellite data from 10 infrared channels (Ch07~16) of GK2A and weather radar reflectivity (dBZ) data from Korea, China, Japan, and other approximately 40 locations, with a spatial resolution of 2 km and a temporal resolution of 10 minutes. The training data was divided into 576×576 pixel-sized patches to prevent memory shortages that often occur when using GPUs during model learning. The training data is constructed from June to August 2020 (3 months) using this

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method, and randomly selected 10,000 samples from the data excluding outliers were applied to the model training. To improve the accuracy of the model, we applied a custom loss function that weights according to radar. As a result, the accuracy was improved while the underestimation of the radar reflectivity was resolved. The results of the generation of AI-based proxy radar data could be used to solve observation gaps in the radar in the East China Sea, which are important for monitoring severe weather on the Korean Peninsula, and responding to dangerous weather in advance.