

S4-07

**Hypothetical Radar-like Rain Rate Generation using Data-to-Data
translation and its applicability for DL based Precipitation Nowcasting**

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Here we present deep-learning (DL)-based data-to-data (D2D) translation framework to simulate a radar-like retrieval of rainfall rates (RRs) and its advantages to apply DL based precipitation nowcasting model. The D2D method comprises normalization and denormalization in preprocessing and postprocessing and an adversarial learning structure for an interdomain conversion between physical values of data such as albedo and brightness temperature (BT), unlike the image-to-image translation using digital number values in image data. The GEO-KOMPSAT-2A (GK2A) and radar hybrid surface rainfall (HSR) datasets over the Korean Peninsula from September 2019 to September 2021 were used as the source and target domains for training and testing the D2D model. The constructed D2D model for ground radar-like rainfall generation was validated using the ground radar-observed rainfall data and compared to the GK2A RR, Precipitation Estimation from Remotely Sensed Information using artificial neural networks-cloud classification system (PERSIANN-CCS), and integrated multisatellite retrievals for global precipitation measurement (IMERG) rainfall products. The D2D model exhibited excellent performance for various rain types in the study area compared to the GK2A RR, PERSIANN-CCS, and IMERG data. Consequently, the D2D model can provide valuable and accurate radar-like rainfall intensity and distribution data with a high temporal resolution

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and complementary rainfall information over lands and oceans without radar observation.