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Probability and deterministic amount of precipitation on the multi-model ensemble

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Multi-model ensemble using statistical post-processing is one of the methods to provide the impact of uncertainties of the Numerical Weather Prediction (NWP) models, with low cost and better accuracy for extreme weather forecasts. Extreme weather events such as heat/cold waves, windstorms, and heavy rainfall result in severe damage in human life and properties. However, the performance of the NWP models, particularly, heavy rain forecast is still low due to the intermittent and non-Gaussian properties. The light rain tends to be overestimated and the strong rain tends to be underestimated averagely on the NWP models. Thus the multi-model ensemble using statistical post-processing is activated to correct the discrepancies between the observation and the model intensity of precipitation.

The aim of this study is to provide the improvement of precipitation forecasts in probabilistic and deterministic aspects using a multi-model ensemble method with more weights on the less error and without any bias correction. Six types of models, namely, Local Data assimilation and Prediction System (LDPS), Local ENsemble System (LENS), Global Data assimilation and Prediction System (GDPS), Ensemble Prediction System-Global (EPSG) of Korea Meteorological Administration (KMA), the single and ensemble models of European Centre for Medium-Range Weather Forecasts (ECMWF), are used to blend. The preliminary results of the multi-model ensemble show similar results to the ECMWF ensemble mean in deterministic for 3-hourly accumulated precipitation over the East Asia and the middle of the performance among individual models in probabilistic over the South Korea. More details of the methodology, results, and improvements will be discussed in the presentation.