Otsuka, S., S. Kotsuki, M. Ohhigashi, and T. Miyoshi, 2019: GSMaP RIKEN Nowcast: Global precipitation nowcasting with data assimilation. *J. Meteor. Soc. Japan*, **97**, 1099-1117. Special Edition on Global Precipitation Measurement (GPM): 5th Anniversary https://doi.org/10.2151/jmsj.2019-061

**Plain Language Summary:** RIKEN has been running an extrapolation-based nowcasting system for global precipitation in real time since January 2016 using GSMaP NRT. The product, called "GSMaP RIKEN Nowcast (RNC)," is disseminated on a webpage in real time. This paper presents how motion vectors can be derived more accurately, and how data assimilation improves the long-term stability of an advection-diffusion model for extrapolation.



Figure 1. (a, c, e, g) Distribution of hit, miss, and false alarm of rain rate greater than 0.1 mm h<sup>-1</sup> with respect to GSMaP MVK for GSMaP RIKEN Nowcast initialized at 0000 UTC 23 March 2018. FT = (a)0, (b) 3, (c) 6, and (d) 12 h. (b, d, f, h) Same as (a, c, e, g) but comparison between GSMaP NRT and **MVK** at the corresponding time.

- Forecast accuracy was gradually and consistently improved by the algorithmic updates that were applied during January 2016 to March 2018. The threat scores increased the most around 40°S and 40°N. A performance drop in the northern hemisphere winter was also reduced by reducing noise in advection.
- Time series of the ensemble spread showed that an increase in the number of available motion vectors by a system update led to a decrease in the ensemble spread, and vice versa.