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## Adaptive Localization for Tropical Cyclones With Satellite Radiances in an Ensemble Kalman Filter

**Chen Wang**, Lili Lei, Zhe-Min Tan, and Kekuan Chu

Nanjing University, School of Atmospheric Sciences, China

One important aspect of successfully implementing an ensemble Kalman filter (EnKF) in a high dimensional geophysical application is covariance localization. But for satellite radiances whose vertical locations are not well defined, covariance localization is not straightforward. The global group filter (GGF) is an adaptive localization algorithm, which can provide adaptively estimated localization parameters including the localization width and vertical location of observations for each channel and every satellite platform of radiance data, and for different regions and times. This adaptive method is based on sample correlations between ensemble priors of observations and state variables, aiming to minimize sampling errors of estimated sample correlations. The adaptively estimated localization parameters are examined here for typhoon Yutu (2018), using the regional model WRF and a cycling EnKF system. The benefits of differentiating the localization parameters for TC and non-TC regions and varying the localization parameters with time are investigated. Results from the 6-h priors verified relative to the conventional and radiance observations show that the adaptively estimated localization parameters generally produce smaller errors than the default Gaspari and Cohn (GC) localization. The adaptively estimated localization parameters better capture the onset of RI and yield improved intensity and structure forecasts for typhoon Yutu (2018) compared to the default GC localization. The time-varying localization parameters have slightly advantages over the time-constant localization parameters. Further improvements are achieved by differentiating the localization parameters for TC and non-TC regions.