

## Comments to the Authors

Review of “Dynamic-Statistic Combined Ensemble Prediction and Impact Factors on China’s Summer Precipitation” by Wang et al., submitted to *Nonlinear Process in Geophysics*.

The study addresses how to improve the prediction skills of summer precipitation in China. The authors introduced an approach, the Unequal-Weighted Ensemble prediction (UWE) which was based on the dynamic-statistic combined schemes, and found that the UWE scheme was promising in improving the prediction skills. In addition, the authors also analyzed some possible impact factors, such as the choice of station-based or grid-based datasets, the method of calculating the ACC and the dispersal intensity.

The paper is interesting and well written, and attempt to explore how to improve the prediction skills of summer precipitation in China. However, some revisions are needed for this work. It can be recommended to publish after the following issues have been well responded. Detailed comments are below.

1. The authors reviewed some papers on obtaining the model error information from the historical datasets in the introduction. In fact, the initial condition errors are also important as the model errors, which have large impacts on the prediction skills. Likewise, some researchers also employed the historical datasets to determine the initial condition errors, such as the nonlinear local Lyapunov exponent (NLLE) method or the local dynamical analogs (LAD) method. I think if the authors could add some review on initial condition errors from NLLE or LAD, it will enrich the introduction. Some papers on NLLE or LAD are as follows,

Li J, Ding R. Temporal–spatial distribution of atmospheric predictability limit by local dynamical analogs[J]. *Monthly Weather Review*, 2011, 139(10): 3265-3283.

Ding R, Li J, Seo K H. Predictability of the Madden–Julian oscillation estimated using observational data[J]. *Monthly Weather Review*, 2010, 138(3): 1004-1013.

Li X, Ding R, Li J. Quantitative study of the relative effects of initial condition and model uncertainties on local predictability in a nonlinear dynamical system[J]. *Chaos, Solitons & Fractals*, 2020, 139: 110094.

Li X, Ding R, Li J. Quantitative comparison of predictabilities of warm and cold events using the backward nonlinear local Lyapunov exponent method[J]. *Advances in Atmospheric Sciences*, 2020, 37: 951-958.

2. The authors presented the unequal-weighted Ensemble prediction (UWE) scheme based on five dynamic-statistic prediction approaches. The unequal-weighted coefficients have significant effects on its performances in prediction skills. Therefore, what are the criteria for determining the unequal-weighted coefficients? More explanations are appreciated.
3. In comparison of the prediction skills between the grid-point observation and station observation, the authors have described the difference between the two observations based on the information from Table 2. However, the authors seemed to lack the descriptions of the fig.3.
4. In fig.5, the probability density distribution of the total precipitation is the normal distribution. Generally, the precipitation shows the skewed distribution. What is the reason, could the authors give some reasons?
5. The authors investigated the relationship between the dispersal intensity and the ACC, and found that high ACCs corresponds to low dispersal intensity. That is, they have the negative correlation. From fig.8, most regions over China, such as the northwest region and coastal areas show the negative correlations. However, the negative correlations are not that evident in the middle regions of China. What is the reason, some clarifications are needed.

#### Minor comments

1. Lines 86-87, the reference format is not correct. Right format is Feng et al. (2013, 2020).
2. Lines 170 and 348, before 'etc', there should be a comma.
3. Line 202, Fig.2 should be replaced with Fig.1.
4. For equation (6), what the  $x_s$ ,  $y_s$ ,  $\bar{x}_s$  and  $\bar{y}_s$  represent? They should be clarified.
5. Line 302 and other part throughout the manuscript, I don't find what the SYS method represents. Is it the abbreviation? If so, please add its full name at the Line 302. If not, please introduce the SYS briefly in the corresponding section.
6. Line 428, it is formula (8), not 'formal (5)'.
7. Line 446, it is quite close, not 'it is quite closet'.