

### **General comments:**

This article titled “Impact of Asian aerosols on the summer monsoon strongly modulated by regional precipitation biases” mainly discusses the challenges of the Asian summer monsoon to climate models, as well as the mutual influence between model bias and atmospheric circulation. However, can some updated data be provided in this manuscript?

### **Specific comments:**

Some images have a poor appearance, such as Figure 3 (g), and the arrows can be adjusted to be thinner. The colorbar can be further refined or a smooth one can be used, as many details cannot be displayed under the current colorbar.

The dataset used in the article seems to lack a quantifiable validation of its accuracy. A quantifiable validation is needed to evaluate its accuracy.

The selection of parameters is usually a crucial step in model development and use, and the article seems to lack detailed explanation of the model's parameter settings.

### **Technical comments:**

**Line 53:** “could albedo” → “cloud albedo”

**Line 53:** ” "cloud albedo and lifetime, and precipitation processes" → “cloud albedo, lifetime, and precipitation processes” There are other errors like this in the text, please check carefully

**Line 67:** "South and East Asian aerosols separately exert a strong influence" → "South and East Asian aerosols exert a strong influence separately"

**Line 72:** "the Asian monsoon march" There is a spelling error or misuse of vocabulary here.

**Line 141:** "in coupled mode ((Liu et al., 2018)." → " in coupled mode (Liu et al., 2018)."

**Line 218:** "Inspection of monthly precipitation and low-level circulation changes reveals a stark contrast over the Indian subcontinent and adjacent ocean between the early and late monsoon season: increased precipitation and anomalous cyclonic flow over the BOB in June, consistent with the seasonal mean, and decreased precipitation

and anomalous anticyclonic winds over India in September (Figs. S2 and S3)." This sentence may be too long, consider splitting it into two or more concise sentences.

**Line 241:** "The accuracy of the simulated regional climate change signal and its attribution to anthropogenic drivers have been suggested to be strongly dependent on the model performance in reproducing the corresponding mean climatological conditions, which represent the baseline state on top of which changes occur (Matsueda and Palmer, 2011; Christidis et al., 2013)." → "has been"

**Line 452:** "For consistency with the analysis of the fixed SST experiments" → "For consistency with the analysis of the experiments with fixed SST"