**Review of the manuscript:**

"**Optimizing physical scheme selection in RegCM5 for improved air–sea fluxes over Southeast Asia**"

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In this manuscript, the authors evaluate the performance of the RegCM5 regional climate model in simulating air–sea fluxes over the Southeast Asian seas. The model was run at a 25 km resolution for the year 2018 using 36 different combinations of physical parameterization schemes, selecting from multiple options for convection, microphysics, planetary boundary layer (PBL), radiation, and cloud fraction. Atmospheric forcing was provided by ERA5 reanalysis at 0.25° resolution, while sea surface temperatures were obtained from the high-resolution SYMPHONIE ocean model running at approximately 0.083° resolution. Model outputs, such as precipitation, surface radiation, latent and sensible heat fluxes, and sea surface wind speed, were evaluated against satellite and reanalysis data. A multi-criteria decision-making framework, incorporating 180 performance metrics across eight oceanic subregions, was used to rank the experiments. The results indicate that the top-performing configuration is a combination of the RRTM radiative transfer scheme, UW-PBL planetary boundary layer, Tiedtke cumulus convection, SUBEX resolved-scale microphysics, and Xu–Randall cloud fraction (identified as 12511, i.e. RRTM/UW-PBL/Tiedtke/SUBEX/Xu–Randall), with the Tiedtke cumulus convection scheme consistently outperforming others, particularly in simulating precipitation and wind. The findings highlight cumulus convection as the primary driver of model performance and suggest that the optimal physical parameterizations may vary depending on the variable of interest (e.g., precipitation vs. shortwave radiation). The manuscript is well written, logically structured, and easy to follow, making it a worthy candidate for publication in Geoscientific Model Development. However, there are some points need to be clarified.

1) First, the authors' use of simulation results from only one neutral year (2018) to evaluate the model's performance is not sufficiently convincing. A single-year simulation provides only one monthly and annual value per grid point for each variable, which introduces substantial uncertainty into the performance assessment due to the lack of statistical robustness. Furthermore, by excluding years influenced by major climate variability phenomena such as ENSO and IOD, the evaluation overlooks the model's capacity to simulate responses under extreme conditions, one of the key strengths of dynamical models. As a result, the findings may be overfitted to neutral conditions and may not adequately reflect the model's robustness or broader applicability across different climate regimes.
2) This study is highly valuable for advancing our understanding of air–sea coupling and for supporting the development of coupled models. However, in many practical applications, the accurate simulation of precipitation and temperature over land is even more critical. In fact, coupled models are still relatively uncommon, and most studies continue to rely on standalone RegCM without ocean coupling. Therefore, I suggest that the authors conduct a parallel analysis using the same model configurations over terrestrial subregions where high-quality observational data are available.
3) Using ERA5 at the same resolution (0.25°) to force RegCM5 is valid and appropriate for a controlled physics sensitivity study, as done by the authors. However, in this setup, the added value of high-resolution spatial detail from the regional model cannot be fully realized./.