The research "Optimal estimation of cloud properties from thermal infrared observations with a combination of deep learning and radiative transfer simulation" has made significant advancements in the field of cloud property retrieval using satellite imagery. The primary finding of the study is the successful integration of traditional radiative transfer simulations with machine learning algorithm, to retrieve cloud optical thickness (COT), cloud effective radius (CER), and cloud top height (CTH) from Moderate Resolution Imaging Spectroradiometer (MODIS) data. This method, referred to as OE-CNN-IR, is effective under both daytime and nighttime conditions, addressing a long-standing limitation of previous retrieval methods. It combines the strengths of both radiative transfer model (RTM)-based cloud retrieval methods and machine learning models. RTM-based methods are physically grounded and can accurately simulate radiance at the top of the atmosphere, while machine learning models, such as TIR-CNN, can quickly and accurately process large amounts of data. By using TIR-CNN retrievals as priori states for iterative processes in the OE method, the OE-CNN-IR method is able to reconcile observed data with physical radiative processes more effectively. I thick there are a few minor issues in the manuscript.

Minor comments:

1. The descriptions of the wavelengths for each band in Table 1 and Figure 2/Figure 3 are inconsistent.
2. In Figure 5, all parameters are lacking units. It is recommended to add the units either in the caption or above the colorbar. This problem also exist in other figures.
3. I thick “Earth” should be capitalized. Please check the full text.
4. Line 111： “6.5μm” lacks space between numbers and units, please check the full text.