

EGU24-3462, updated on 13 Jul 2024

<https://doi.org/10.5194/egusphere-egu24-3462>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Assimilation of HY-2D scatterometer wind field data in CMA-GFS

Chuanwen Wei, Wei Han, Yan Liu, Hao Hu, Huijuan Lu, Hongyi Xiao, and Dan Wang

Satellite sea surface wind fields can compensate for the shortcomings of conventional observation data, thereby improving the forecasting skills of global medium-range numerical weather models. China successfully launched the HY2D satellite carrying a Ku band microwave scatterometer (HSCAT) on May 19, 2021. It can provide a large amount of high-quality sea surface wind field data for numerical forecasting models. In order to test the potential application of HY2D sea surface wind field data in the Global Assimilation Forecasting System of the China Meteorological Administration (CMA-GFS). A three-step study was conducted, with the first step being the timeliness evaluation of HY2D wind, followed by the quality evaluation of HY2D wind using ERA5 and buoy data, and finally assessment of impacts of the HY2D wind assimilation on the analyses and forecasts. Two sets of assimilation experiments were conducted: the control experiment without HY2D wind (CTRL) and sensitivity experiment with HY2D wind based on a new quality control scheme (HY2D-FlagQC). The experimental period is from March 1, 2023 to April 1, 2023. The results show that the timeliness of HY2D wind field obtained through National Satellite Ocean Application Service (NSOAS) has been improved by about 20% compared to Koninklijk Nederlands Meteorologisch Instituut (KNMI). But the timeliness fluctuation is relatively large in terms of time and space. The root mean square error of HY2D wind field is less than 2m/s. After assimilating the HY2D wind, the analysis errors of the wind fields in the lower-middle troposphere of the tropics and the southern hemisphere (SH) are significantly reduced. Furthermore, assimilating the HY2D wind data can improve the forecast skill of wind, geopotential height, and temperature in the troposphere of the tropics and SH.