WIND-4D

On the 4-D Consistency of Satellite Wind Products for Regional NWP Data Assimilation

The resolution of regional numerical weather prediction (NWP) models has continuously been increased over the past decades, in part, thanks to the improved computational capabilities. At such small scales, the fast weather evolution is driven by wind rather than by temperature and pressure. Over the ocean, where global NWP models are not able to resolve wind scales below 150 km, regional models provide wind dynamics and variance equivalent to 25 km or lower. However, although this variance is realistic, it often results in spurious circulation (e.g., moist convection systems), thus misleading weather forecasts and interpretation. An accurate and consistent initialization of the evolution of the 3-dimensional (3-D) wind structure is therefore essential in regional weather analysis. The research fellow would focus on a comprehensive characterization of the spatial scales and measurement errors for the different operational space-borne wind products currently used and/or planned to be used in regional models. In addition, the fellow would thoroughly investigate and improve the 4-D (including time) consistency between the different horizontal and/or vertical satellite wind products under study. Such products include OSI SAF scatterometer-derived sea-surface wind fields, NWC SAF Atmospheric Motion Vectors (AMVs), the upcoming ADM-Aeolus and/or IASI wind profiles. Densely sampled aircraft wind profiles (Mode-S) will be used to verify and characterize the satellite products. To this end, the experience of the NWC, OSI, and NWP SAFs will be exploited. Moreover, data assimilation experiments of the consistent datasets into the

Harmonie-AROME regional model will be carried out in two different regions, i.e., the Netherlands and the Iberian Peninsula regional configurations.

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Dates

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