

SPECIAL PROJECT PROGRESS REPORT

All the following mandatory information needs to be provided. The length should *reflect the complexity and duration* of the project.

Reporting year

2021

Project Title:

On the 4-D consistency of satellite wind products for regional NWP data assimilation (WIND-4D)

Computer Project Account:

SPESPORT

Principal Investigator(s):

Marcos Portabella Arnús

Affiliation:

Institute of Marine Sciences (ICM-CSIC)

Name of ECMWF scientist(s) collaborating to the project
(if applicable)

Federico Cossu (ICM-CSIC), Isabel Monteiro (IPMA), Javier Calvo (AEMET), Ad Stoffelen (KNMI), Gert-Jan Marseille (KNMI), Fabíola Silva (IPMA)

Start date of the project:

January 1st, 2019

Expected end date:

December 31st, 2021

Computer resources allocated/used for the current year and the previous one
(if applicable)

Please answer for all project resources

		Previous year		Current year	
		Allocated	Used	Allocated	Used
High Performance Computing Facility	(units)	10000000	0	10000000	0
Data storage capacity	(Gbytes)	10000	0	18000	0

Summary of project objectives (10 lines max)

An accurate and consistent initialization of the evolution of the 3-dimensional (3-D) wind structure is essential in regional weather analysis. The project focuses 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 project will thoroughly investigate and improve the 4-D (including time) consistency between the different horizontal and/or vertical satellite wind products (scatterometer, IASI, AMVs, ADM-Aeolus) under study. Densely sampled aircraft wind profiles (Mode-S) will be used to verify and characterize the satellite products. 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.

Summary of problems encountered (10 lines max)

As reported last year, the start of the project was substantially delayed by a variety of reasons. The 3-year post-doctoral fellowship contract associated to this project (granted to Federico Cossu) finally started in mid-September 2019. Moreover, the Covid situation has negatively impacted Federico's training plans on HPC use and data assimilation, which included two extended visits to KNMI in 2020, which were cancelled due to Covid restrictions. In 2021, no travel plans are yet in place because of the same reason, but a visit to KNMI in the second half of 2021 is under consideration. This has resulted in an overall delay of about two years in the project, which in turn may cause an overall delay of the use of ECMWF IFS resources of about two and a half years. I sincerely apologize for this delay.

Summary of plans for the continuation of the project (10 lines max)

Federico Cossu is currently focused on the remote sensing aspects of the WIND-4D project. Note that during the first year of WIND-4D, the focus is on remote sensing rather than on data assimilation, but because of the Covid situation, the project objectives have been re-oriented towards a more intense R&D work on remote sensing, while data assimilation experiments will be carried out only by the end of the project. Nevertheless, we plan, together with our partners (notably IPMA and KNMI), to run some Harmonie experiments during the second half of 2021. As already mentioned in last year's progress report, the project would greatly benefit from an extension of the currently granted HPC capabilities through 2022, to guarantee HPC access during the third year of the WIND-4D research fellowship (which will run until mid-September 2022).

List of publications/reports from the project with complete references

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Summary of results

If submitted **during the first project year**, please summarise the results achieved during the period from the project start to June of the current year. A few paragraphs might be sufficient. If submitted **during the second project year**, this summary should be more detailed and cover the period from the project start. The length, at most 8 pages, should reflect the complexity of the project. Alternatively, it could be replaced by a short summary plus an existing scientific report on the project attached to this document. If submitted **during the third project year**, please summarise the results achieved during the period from July of the previous year to June of the current year. A few paragraphs might be sufficient.

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