

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 2023

Project Title: Towards operational attribution of predicted signals in sub-seasonal forecasts

Computer Project Account: spfikarp

Principal Investigator(s): Dr. Alexey Karpechko, Ms. Irina Statnaia

Affiliation: Finnish Meteorological Institute (FMI)

Name of ECMWF scientist(s) collaborating to the project (if applicable) Dr. Inna Polichtchouk

Start date of the project: 1.1.2021

Expected end date: 31.12.2024.....

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)	3,309,000	5,992	3309000	0
Data storage capacity	(Gbytes)	7,221	441	7221	0

Summary of project objectives (10 lines max)

This project aims to investigate sources of predicted signals in sub-seasonal forecasts for Europe and to test feasibility of detecting such sources in operational forecasting. To this end, we aim to perform a set of relaxation experiments towards selected ensemble members of the control forecasts that exhibit pronounced signals in the stratosphere and/or the Tropics - regions of the atmosphere known for their extended predictability. The experiments will allow quantifying strength of the signal associated with these sources, and, potentially, signal attribution. The rationale behind our approach is the assumption that the knowledge of sources of forecasted signals can help operational forecast users in their applications.

Summary of problems encountered (10 lines max)

No problems

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

So far, only the role of the stratosphere in predictability of two events was studied (see report for the previous year); therefore the plan for the continuation of the project is to analyse other case studies as well as to analyse the role of the tropics in the predictability. While the progress was too slow due to lack of resources, the plan for the next year remains the same since more cases are necessary to draw the conclusions.

List of publications/reports from the project with complete references

Karpechko, A, F. Vitart, I. Statnaia, M. Alonso-Balmaseda, A. Charlton-Perez and I. Polichtchouk, The tropical influence on sub-seasonal predictability of wintertime stratosphere and stratosphere-troposphere coupling, QJRMS, in revision.

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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Unfortunately, due to other commitments the experiments were not continued during this year. However, we have secured funding to continue experiments, therefore, I would like to ask, if possible, to transfer the reserved computing resources for the next year.

June 2023

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