

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 2025

Project Title: Exploiting the spectral dimension of outgoing longwave radiation to open a new window on climate model evaluation

Computer Project Account: itsf

Principal Investigator(s): Stefano Della Fera

Affiliation: CNR-IFAC

Name of ECMWF scientist(s) collaborating to the project
(if applicable) Federico Fabiano, Jost von Hardenberg

Start date of the project: 01/01/2025

Expected end date: 31/12/2025

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	SBU			23025000	0
Data storage capacity	(Gbytes)			71750	0

Summary of project objectives (10 lines max)

The project aims to investigate the impact of spectral measurements on climate model tuning and the assessment of climate feedbacks. The study is based on the use of an IASI/FORUM simulator, which has been integrated into the EC-Earth climate model to simulate synthetic radiances compatible with IASI and FORUM observations

Summary of problems encountered (10 lines max)

No significant issues were encountered, and the simulations were started in July.

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

We plan to perform a set of present-day atmosphere-only simulations, perturbing selected tuning parameters to evaluate their effect on longwave radiances. Additionally, we will explore the potential of FORUM measurements to disentangle radiative forcing and feedbacks from OLR observations. To this end, a set of coupled atmosphere-ocean simulations with EC-Earth will be carried out for the historical period (2000–2014) and the near future (2015–2049), assuming the SSP2 and SSP5 scenarios.

List of publications/reports from the project with complete references

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.

During the first period (January–June), all the experimental setup was finalized, and the EC-Earth climate model with the integrated IASI/FORUM simulator is now fully operational in both clear-sky and all-sky conditions. As a result, the simulations were launched in July and will continue through September to achieve the project objectives.