SPECIAL PROJECT PROGRESS REPORT

Progress Reports should be 2 to 10 pages in length, depending on importance of the project. All the following mandatory information needs to be provided.

Reporting year ……2011……..

Project Title: …… Interactions between the Atlantic Ocean, African monsoon, the Indian and Pacific Oceans using the EC-Earth and IFS modelling systems …

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Computer Project Account: ……SPITDIPO…….....

Principal Investigator(s): ……Fred Kucharski……

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Affiliation: … Abdus Salam International Centre for Theoretical Physics (ICTP)…

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

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Start date of the project: …30. 04. 2010……

Expected end date: …30.12.2012…….....

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)	500,00	?	500,00	?
Data storage capacity	(Gbytes)	1000	?	1000	?

Summary of project objectives

(10 lines max)

Previous work has shown the possibility that the tropical Atlantic has an unexpectedly strong Influence on the Indian Ocean, Indian Monsoon and Pacific Ocean.
Since most of these studies are based only on observational data and intermediate complexity model simulations, the aim of this project is to use the latest state-of-the-art modelling systems EC-Earth and/or the IFS to confirm and refine the various hypothesises that have been made previously. Relatively high-resolution and complex physics simulations are essential to increase confidence in the hypothesis that the tropical Atlantic may have a much stronger impact on the surrounding ocean and land masses than previously thought. However, also simulations with the intermediate complexity ICTPAGCM coupled to OPA/NEMO will be performed, because the efficiency of this model enables to assess and validate new techniques quickly.

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Summary of problems encountered (if any)

(20 lines max)

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Summary of results of the current year (from July of previous year to June of current year)

This section should comprise 1 to 8 pages and can be replaced by a short summary plus an existing scientific report on the project

The first 44-year long control simulation with EC-Earth has been conducted in 2010 has been further analysed in 2011. The integration has been performed at the EC-Earth standard resolution of T159 with 62 vertical levels.

The model reproduces well the ENSO influence on South East South American (SESA) climate, with the typical positive precipitation response that is the southern part of a dipole (Fig. 1).

The model reproduces also well the extratropical influences on the South Asian monsoon (see Fig. 2 and 3). This result has been published in Syed et al. (2011).

Furthermore, the ICTP AGCM coupled to OPA/NEMO has been re-installed on the new ECMWF machine and first tests have been performed.

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http://www.ecmwf.int/about/computer_access_registration/forms/

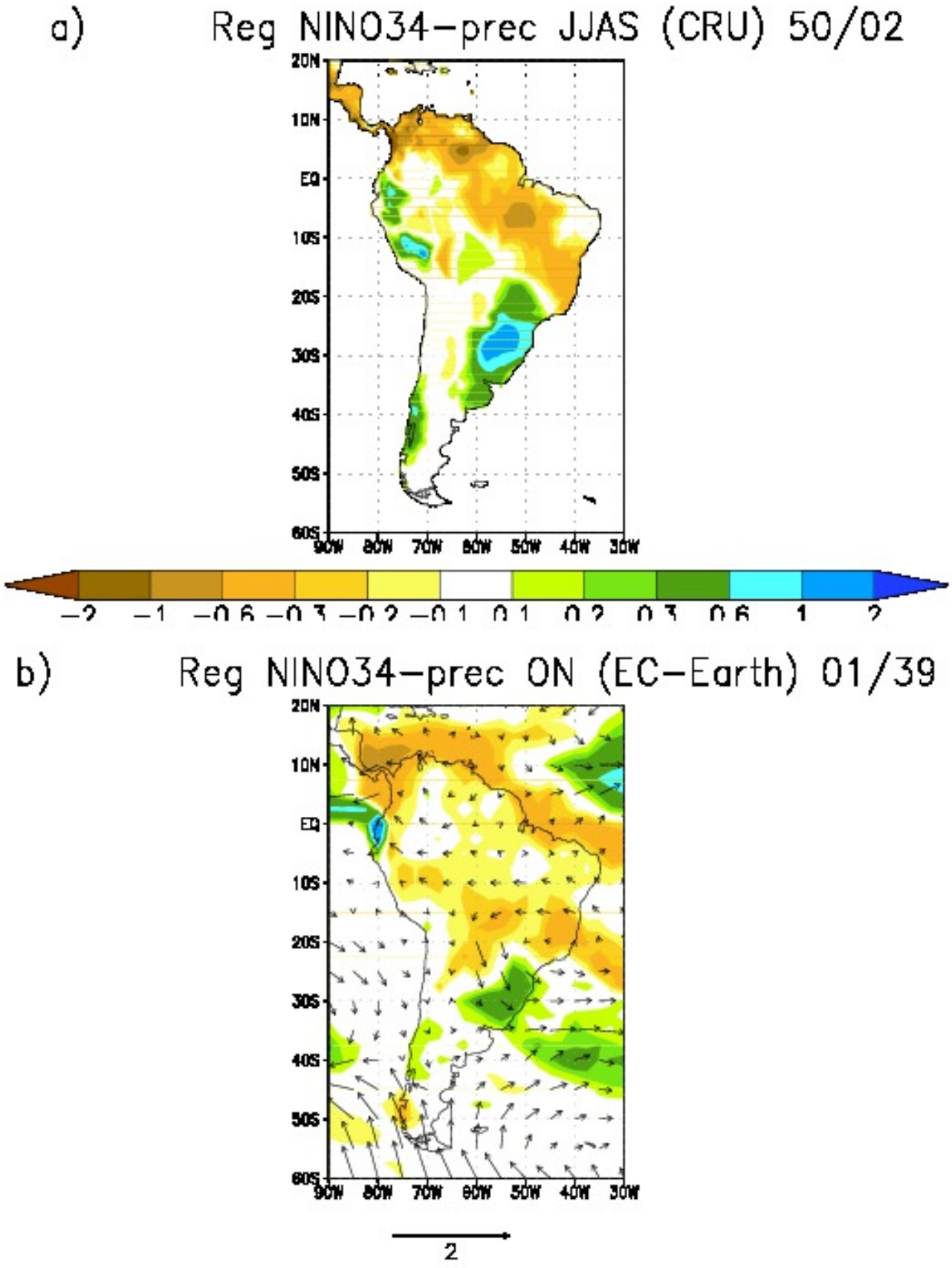

Fig1: Precipitation and low-level wind response to ENSO in a) CRU and b) EC-Earth. Units are mm/day For precipitation and m/s for winds.

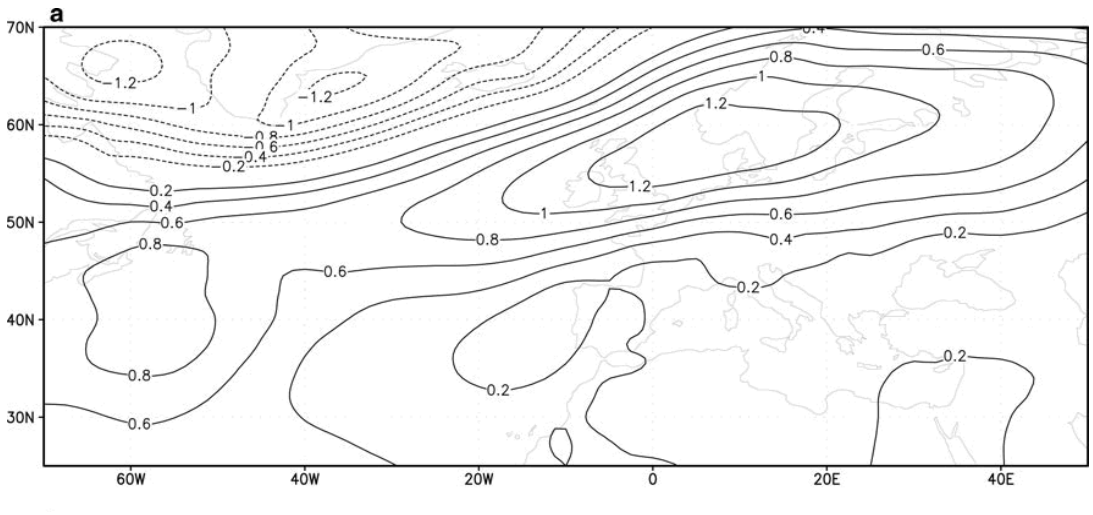

Fig. 2: Summer NAO pattern of the EC-Earth simulation as defined by the 2nd EOF of surface pressure in the North Atlantic region. Units are hPa.

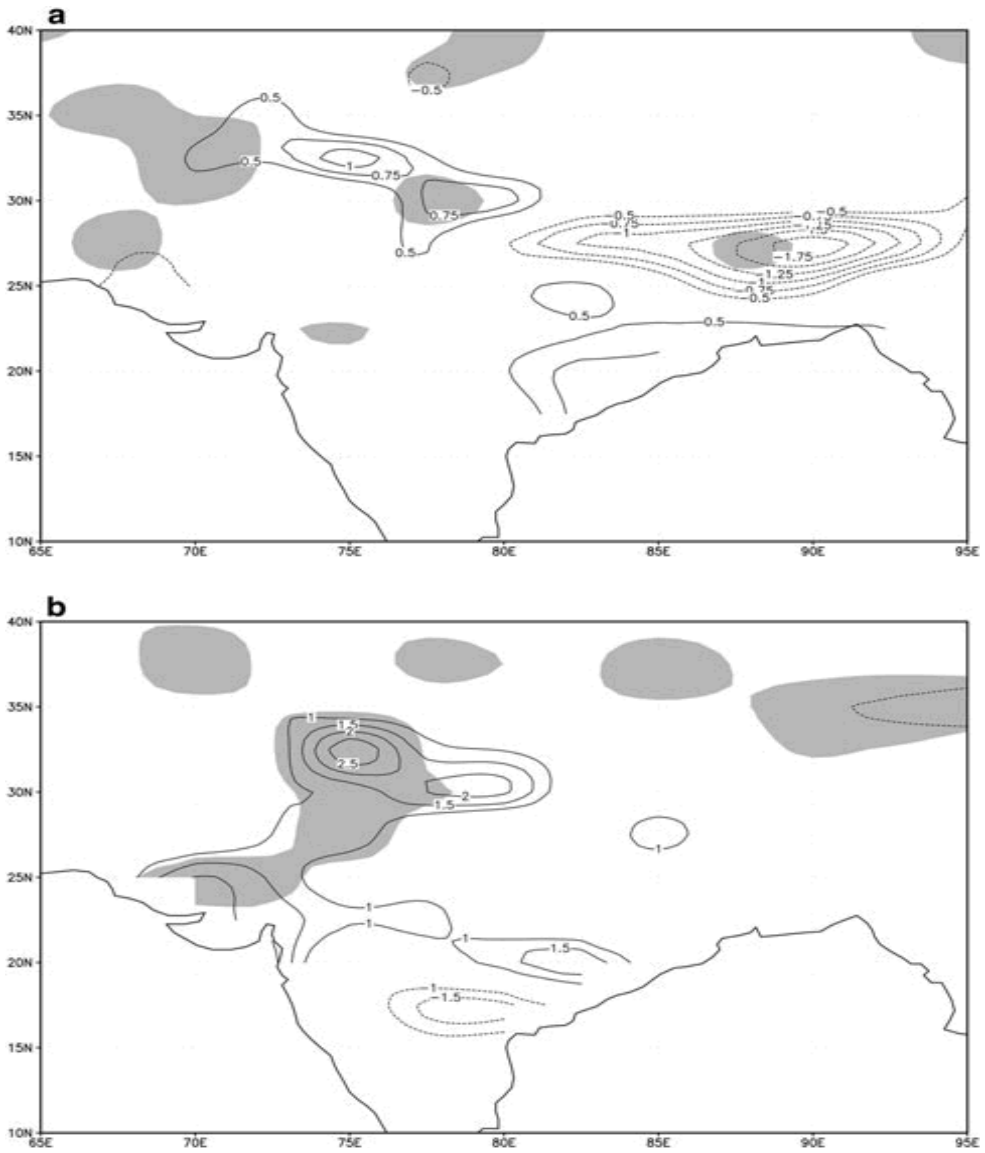

Fig. 3 a) Summer NAO influence on South Asian rainfall in the EC-Earth control simulation.
b) Circumglobal teleconnection influence on South Asian rainbfall. Units are mm/day.

List of publications/reports from the project with complete references

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F. S. Syed , J. H. Yoo , H. Kornich, F. Kucharski, 2011: Extratropical influences on the inter-annual variability of South-Asian monsoon. *Clim Dyn,* DOI 10.1007/s00382-011-1059-4……
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Summary of plans for the continuation of the project

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…For the remaining of this year, targeted integrations using EC-Earth and ICTP AGCM - NEMO/OPA are planned in order to investigate the teleconnection of the tropical Atlantic to remote regions.

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