REQUEST FOR ADDITIONAL RESOURCES IN THE CURRENT YEAR FOR AN EXISTING SPECIAL PROJECT

MEMBER STATE: Italy

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Project title: **COSMO NWP meteorological test suite**

Project account: **SPITRASP**

Additional computer resources requested for	01.09.2016
High Performance Computing Facility (units)	2.500.000
Data storage capacity (total) (Gbytes)	400

Continue overleaf

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     □   The Principal Investigator is the contact person for this Special Project

Technical reasons and scientific justifications why additional resources are needed

The aim of the COSMO NWP Meteorological Test Suite Special Project is to employ the software environment built on the ECMWF platform during the SPITRASP project (2013-2015) with the aim to perform carefully-controlled and rigorous testing, including the calculation of verification statistics, for any COSMO model test-version. This allows the evaluation of new model versions previous to consideration for operational implementation (official version) according to source code management procedure. The procedure facilitates the decision whether the upgrade of a model test version to a new release is possible, while offering the possibility to evaluate the impact that all implemented numerical or physical processes advances bring to convection permitting model resolutions.

By conducting controlled testing to a NWP model, including the generation of objective verification statistics, it can be possible to provide community with guidance for selecting a new operational implementation. In the same time, such designated testing also provides the research community with baselines against which the impacts of new techniques can be evaluated on a larger spatial and temporal domain.

Until now, five model versions have been installed and evaluated overall in the framework of the SPITRASP special project and more model versions are expected to be tested using this platform. The computer resources are used in order to run the COSMO model and for the model verification using the VERSUS software. The model output obtained from the numerical experiments is stored locally in the ECFS system. Also, to set-up and properly run the VERSUS software, the dedicated machine at ECMWF is used for internal use only (no need of Internet surfing).

The runs performed so far during 2016 with the COSMO-model on the new Broadwell processors turned out to be more expensive than expected. Of course, this could not be foreseen last year as the new processors were not yet available for testing.

Activities in the frame of the Special Project (including use of resources) also have to be carried out in the second part of the year, when another official release of the COSMO model will be available (version 5.05) and should also be tested at both resolutions (7 km and 2.8 km). This new version of the COSMO model will contain major changes compared to the older versions which is an important step for further developments in the model.

At present, we have already used 4.851.347 out of the 5.000.000 BU allocation for 2016 (97%) and we have still to perform the following tests for the new version which is to be released by the end of the year:

- runs at 2.8 km, 50 model levels; 48h forecast range: each run costs about 36500 BU
- runs at 7.0 km, 40 model levels; 72h forecast range: each run costs about 3000 BU

Since experimentation will be run for 60 days, the BU requirement amounts to:
(36500 +3000) *60 = 2.370.000
Considering the computer time needed by the interpolation from ECMWF model to COSMO grid and by the archive, the overall request grows to 2.500.000 Bus, plus 400 Gbytes to archive the fields.