

REQUEST FOR A SPECIAL PROJECT 2020–2022

MEMBER STATE: ...Denmark.....

Principal Investigator¹: ...Jian Su.....

Affiliation: ...Danish Meteorological Institute.....

Address: ...Lyngby 100,.....
 ...2100, Copenhagen.....
 ...Denmark.....

Other researchers:

Project Title: ...Regional ocean model climate simulations for ‘Danish Climate Atlas project’.....

If this is a continuation of an existing project, please state the computer project account assigned previously.	SP _____
Starting year: (A project can have a duration of up to 3 years, agreed at the beginning of the project.)	2020
Would you accept support for 1 year only, if necessary?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

Computer resources required for 2020-2022: (To make changes to an existing project please submit an amended version of the original form.)	2020	2021	2022
High Performance Computing Facility (SBU)	1,000,000	1,000,000	1,000,000
Accumulated data storage (total archive volume) ² (GB)	2000	2000	2000

Continue overleaf

¹ The Principal Investigator will act as contact person for this Special Project and, in particular, will be asked to register the project, provide annual progress reports of the project’s activities, etc.

² These figures refer to data archived in ECFS and MARS. If e.g. you archive x GB in year one and y GB in year two and don’t delete anything you need to request x + y GB for the second project year etc.

Principal Investigator:Jian Su.....

Project Title: Regional ocean model climate simulations for ‘Danish Climate Atlas project’

Extended abstract

The Danish Meteorological Institute (DMI) is developing a nationally funded ‘Climate Atlas for Denmark’, presenting scenarios of future climate at the municipality level i.e. on a spatial scale of a few tens of kilometers. The aim is to facilitate climate change adaptation planning through communication of trustworthy information based on climate model results and observations.

The climate atlas will provide climate change scenarios for the near and far future. We use operational regional ocean model HBM to perform the climate simulations. The meteorological forcing is from the EURO-CORDEX-11 database. Climate scenarios for water temperature, salinity, sea level as well as other diagnostic variables will be available for the RCP4.5 and RCP8.5 emission scenarios at the end of the project. Special focus will be on future changes of extreme events, e.g. storm surges, which represent threats to lives and properties. The detailed content of the climate atlas is being planned in collaboration with municipalities and utility companies.

The major computing task would be located at local hpc. However, some sensitivity studies could be performed at ECMWF for some event-scale studies. The calculation of the whole year simulation would be 400,000 SBUs. We only planned some experiments for some storm events (< 1 week). Therefore, I estimated the total integration time should be less than three years.

The HBM code is parallelized and already tested at ECMWF. However, we have different version of HBM. We need to test how efficiently to perform the HBM model for climate simulations. We would like to test it in ECMWF to ensure we could efficiently use ECMWF resources in future.