Project: **834** Project title: **HD(CP)2 M (Modelling)** Project lead: Björn **Stevens,** Rieke **Heinze (MPI)** Panos **Adamidis**, Joachim **Biercamp**, Kerstin **Fieg (DKRZ)** Reporting period: **01.01.2016** - **31.12.2016** 

## Report 2016

For 2016 the WLA granted nearly 2 Mio node\*h to the HD(CP)2 Project M, which is 27% of the total amount of computing time available on *Mistral*. This is a lot, but reflects the magnitude of the problem and the ambition of the HD(CP)2 Project as a "Lighthouse project" for the German Climate Research Community.

The year 2016 was characterized by two important transitions:

- HD(CP)2 Phase I ended in Feb. 2016 and Phase II started April 2016. The arising gap went along with a slowing down of the production of experiments due to staff leaving at end of Phase 1, new staff starting (with own scientific focus and different backgrounds) between April 2016 and October 2016.
  - The Phase I Phase II transition was accompanied with a change in the focus: scientific tasks shifted from HD(CP)2 project M to S - reflecting, that in Phase II project M is a more service oriented work package than it was in Phase I
- DKRZs *Mistral* was upgraded compute and storage resources were nearly doubled.
  - This upgrade caused hardware and software problems, so simulations of experiments from Phase I were shifted to a later date and were performed until late summer 2016.

### **1. Experiments performed successfully**

After intensive discussion among the HD(CP)2 Community the days with HOPE observation data and interesting features observed were selected and ranked as "The Golden Days".

The experiments (in blue) can be understood as the *main results* of Phase 1. They were performed between January 2016 and end August 2016.

Up to now following dates are computed and finalizes in 2016 (Status: 21. 10.2016)

```
20.04.2013
24.04.2013
25.04.2013
26.04.2013 (2 different setups)
02.05.2013 (2 different setups)
11.05.2013
05.05.2013
28.05.2013
```

# 2. Justification of used Resources

#### **Compute Resources**

1. Each simulation day accounted for approximately 70000 node hours (on 400 nodes in average)

 Note: two of the experiments were simulated more than once (e.g. because of turbulence scheme had to be updated, additional requirements came up during evaluation process, provide HD(CP)2 data for international visualization competition SciViz).

The amount of computing resources needed to get the results: 700.000 Node\*h
2. Due to a software problem (time limit problem) on *Mistral* we used

compute resources without getting useful results

• 312 hours \* 400 nodes =

3. Expired resources due to shifting of days / gap between Phase I

and Phase II / bug fixing work

125.000 Node\*h.

ug lixing work

<u>300.000 Node\*h</u> 1 125.000 Node\*h

### Storage

The Data Management Plan (DMP) attached to the application describes in detail the amount of data stored for the individual experiments on */work* and *HPSS archive* resources. As a summary:

- /work: **1358 TB** of data were stored, which is nearly 200% of what we got granted in 2016, and nearly exactly what we asked for in the last proposal (1370 TB).
- HPSS archive: 321 TB (raw output from experiments) were stored