

# E2SCMS3

9<sup>th</sup> – 21<sup>st</sup> June, 2016  
Helsinki, Finland

## Ocean albedo increase experiment with FAMOUS

### Setup and re-compilation

- i. Using the Unified Model User Interface (UMUI), copy the control job (*xlqsb*) to your experiment, as per instructions given in 'Setup notes for FAMOUS model experiments' (see sections 1 to 5.1).
- ii. Compile the model executable, as per section 6.
- iii. The FAMOUS Fortran routines can be found on *archer* in `/work/n02/n02/<user ID>/<job ID>/compile.<job ID>/`, where `<job ID>` is the 5-letter UM simulation identifier given in the UMUI. For this experiment, the following code changes should be made to the routine `fts1a.f` to modify ocean albedo:
  - Change the variable `ADIFC` from its current value of 0.06 to 0.16 (see line 158), which is an increase of approximately 166%. This is the albedo value for diffuse radiation.
  - The ocean albedo for direct-beam radiation (variable `SAOS`) is calculated at lines 192 and 194, based on the solar zenith angle. Insert a 2.66 multiplier in the numerator of each of these equations.
  - Save these changes.
- iv. Append the following lines to the end of `makefile.compile` (please note the tab at the start of the second line):

```
f.o:  
    $(FORT) $(FORTOPTS) -c $<
```

(An example may be found at `/work/n02/n02/bakera/xmraj/compile.xmraj/makefile.compile`).
- v. Re-compile the model. This builds an executable which replaces that previously generated for the control job.
  - First, remove the executable previously generated for the control job. This file is ~15 MB in size and is found at `/work/n02/n02/<user ID>/<job ID>/<job ID>.exec`
  - Remove `.o` files from the `compile.<job ID>/` directory and run the following commands:
    - `make -f makefile.compile`
    - `make -f makefile.link`
- vi. From the UMUI, submit the NRUN, then CRUN jobs (see section 7). *Do not process this job*. Finally, convert your output data to NetCDF format (see section 8).