Metos3D

`model`

Jaroslaw Piwonski*, Thomas Slawig†

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1 Model interface

Metos3D [1] can be coupled to every (biogeochemical) model that conforms to the following interface:

```
subroutine metos3dbgc(ny, nx, nu, nb, nd, dt, q, t, y, u, b, d, ndiag, diag)
    integer :: ny              ! tracer count
    integer :: nx              ! layer count
    integer :: nu              ! parameter count
    integer :: nb              ! boundary condition count
    integer :: nd              ! domain condition count
    integer :: ndiag           ! diagnostic variable count
    real*8  :: dt              ! ocean time step
    real*8  :: q(nx, ny)       ! bgc model output
    real*8  :: t               ! point in time
    real*8  :: y(nx, ny)       ! bgc model input
    real*8  :: u(nu)           ! parameters
    real*8  :: b(nb)           ! boundary conditions
    real*8  :: d(nx, nd)       ! domain conditions
    real*8  :: diag(nx, ndiag) ! diagnostic variables
end subroutine
```

The interface decouples biogeochemical models and driver routines (ocean circulation, forcing, geometry) programmatically. It gives you the possibility to provide a free number of tracers, parameters, boundary and domain conditions. It suits well an optimization as well as an Automatic Differentiation (AD) context.

The interface changed slightly since it was introduced for the first time. The initial version can be found at [1].

*`jpi@informatik.uni-kiel.de`

†`ts@informatik.uni-kiel.de`, both: Department of Computer Science, Algorithmic Optimal Control – Computational Marine Science, Excellence Cluster The Future Ocean, Christian-Albrechts-Platz 4, 24118 Kiel, Germany.

References

[1] J. Piwonski and T. Slawig. Metos3D: the Marine Ecosystem Toolkit for Optimization and Simulation in 3-D – Part 1: Simulation Package v0.3.2. *Geoscientific Model Development*, 9:3729–3750, 2016.