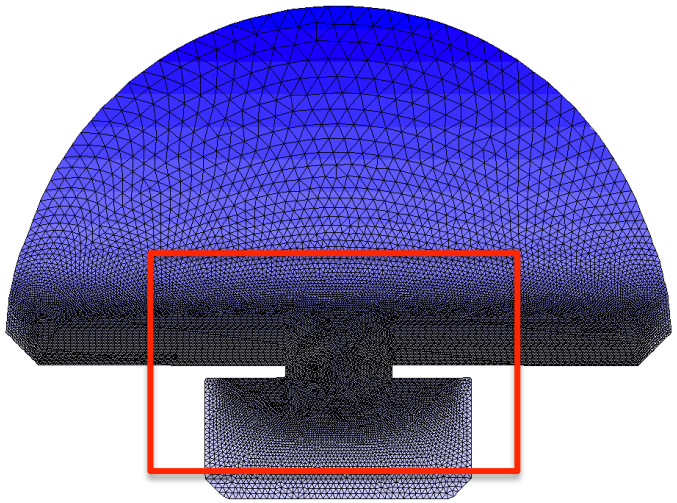
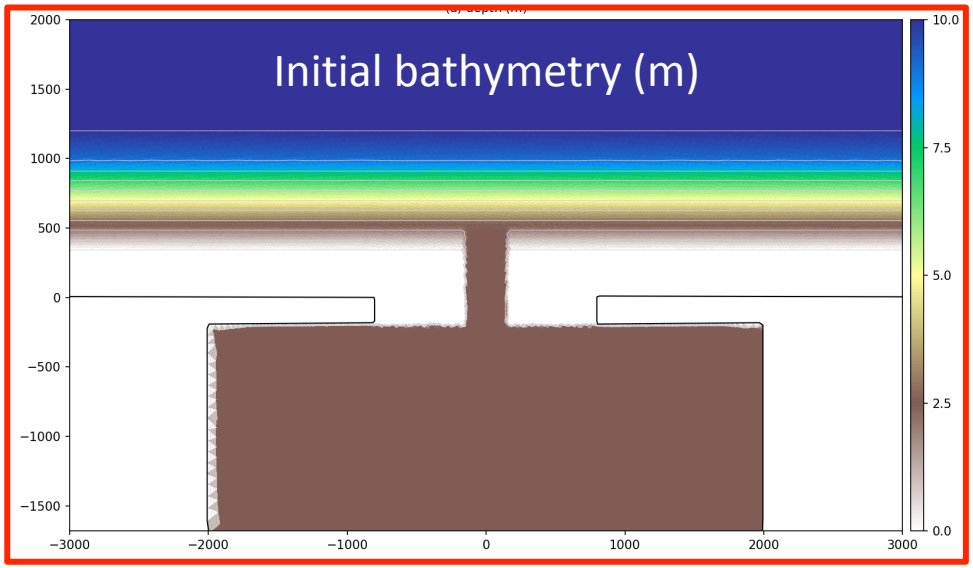
Deposition flux formulation in SED3D

Idealized inlet case





Simulations of 4 days with reference or new deposition flux

21 sigma levels (refined near the bottom)

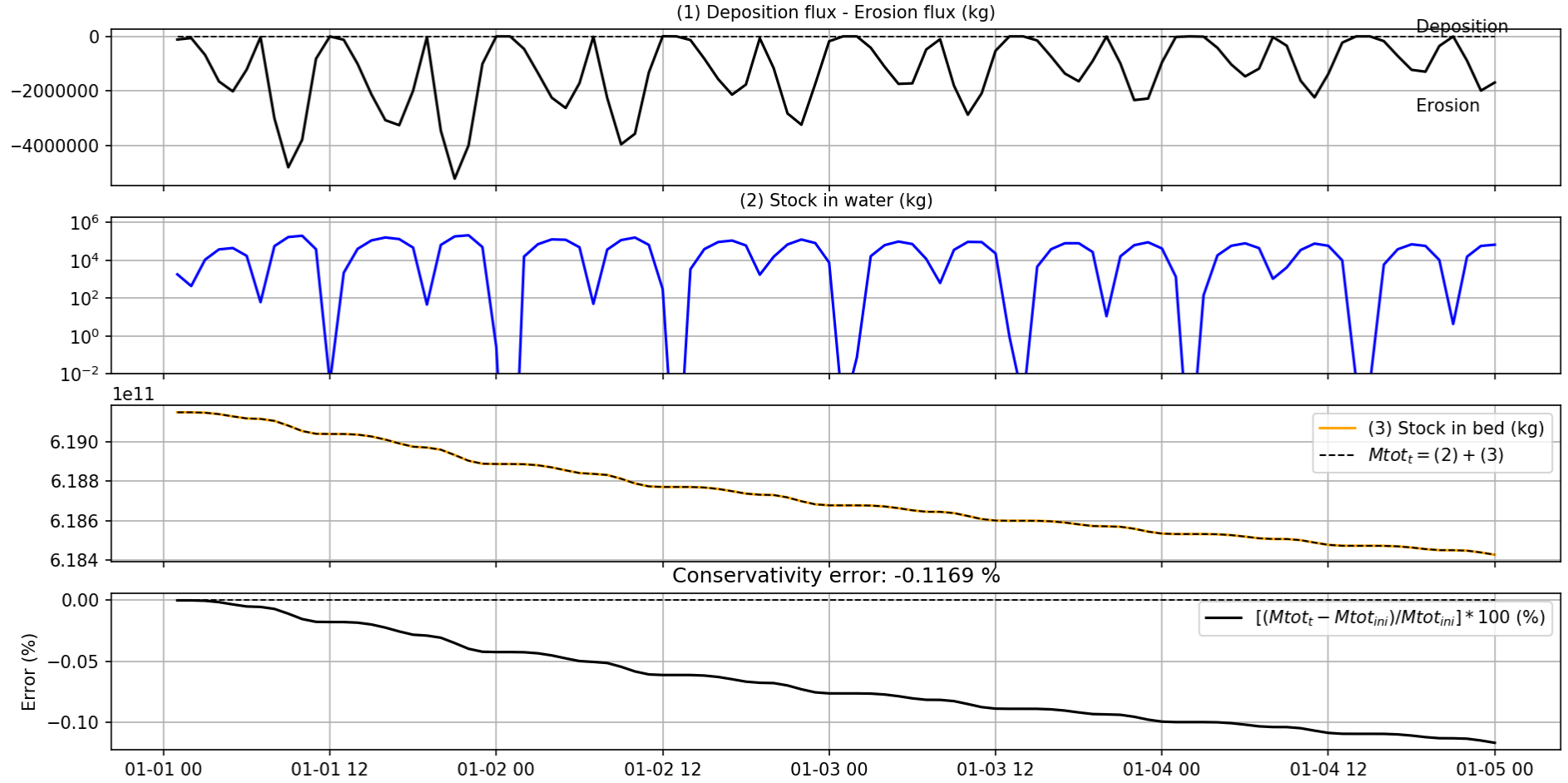
Forcing: Tide only (M2 constituent ; 1.5 m)

Sediment

- Suspended transport only
- 1 sand of 0.15 mm
- Bed compartment : 1 layer (15 m thick), porosity=0.4
- Morphological factor : 6

Conservation of total sediment mass

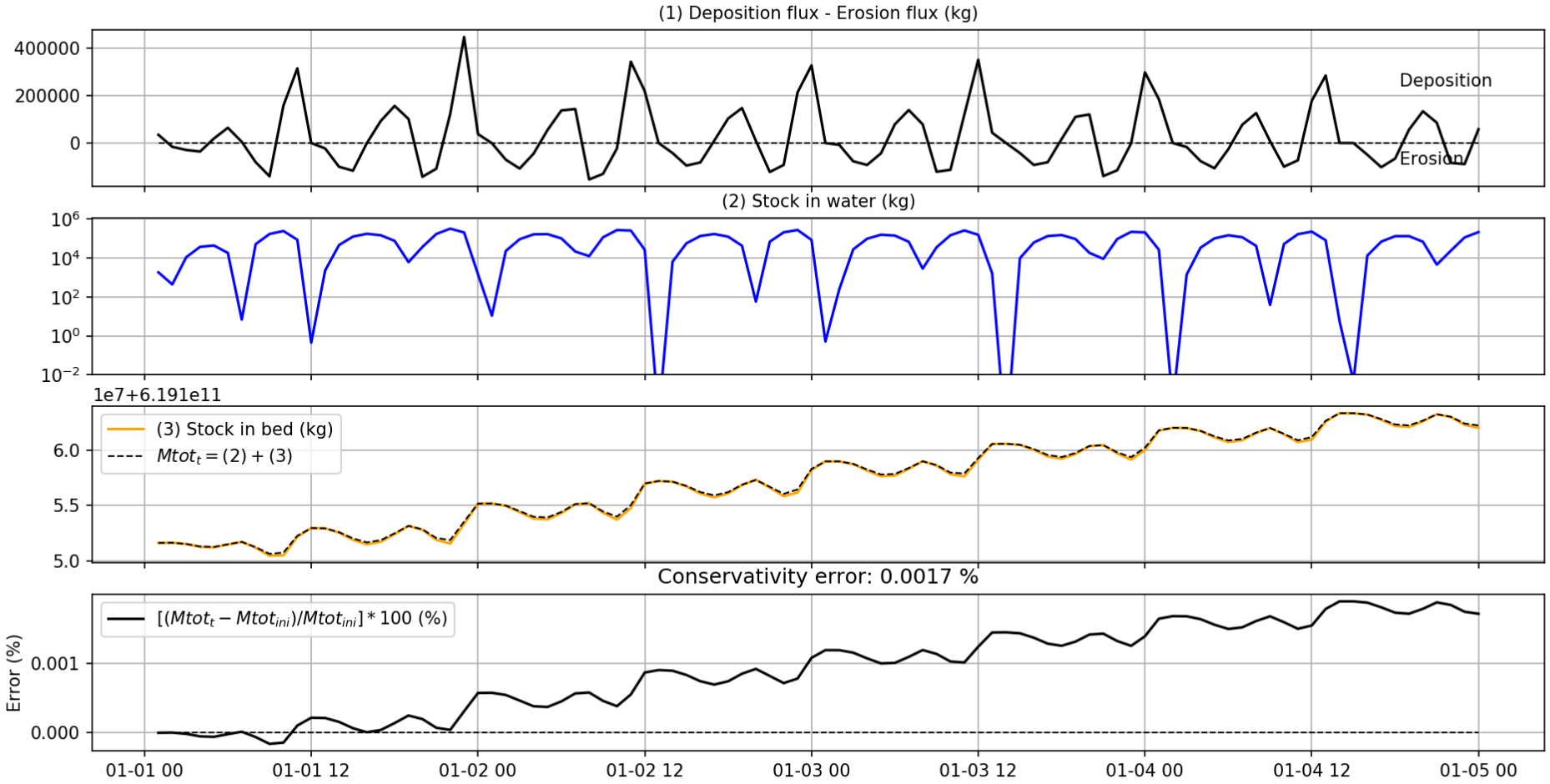
Reference deposition flux



→loss of 0.12% in 4 days (even with a 15-m thick bed!)

Conservation of total sediment mass

New deposition flux



→ error reduced to 0.002% during the same period

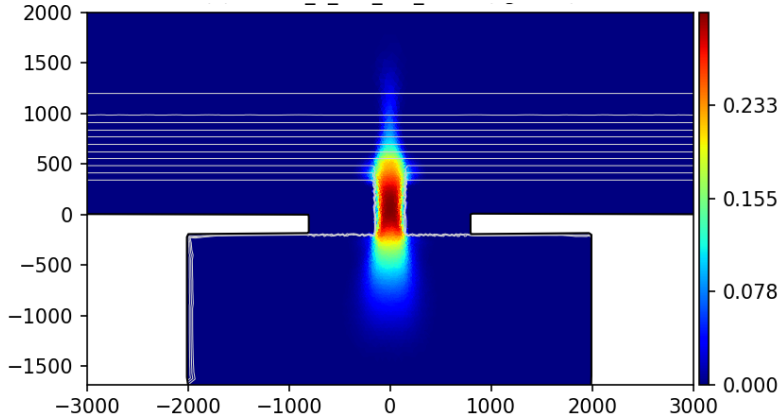
Average suspended sediment concentrations (kg/m^3)

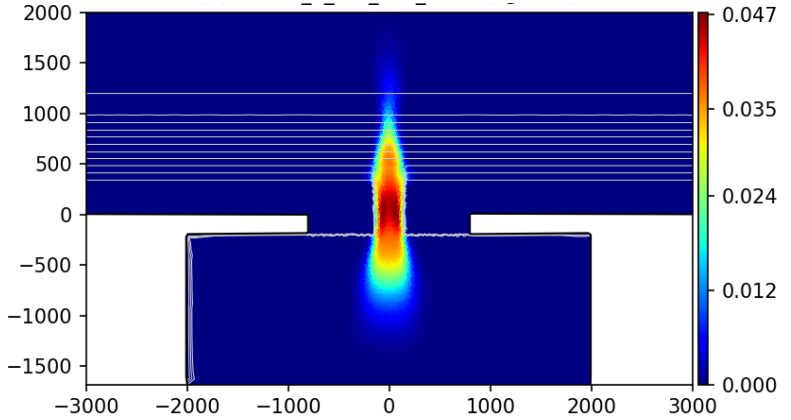
SSC bottom

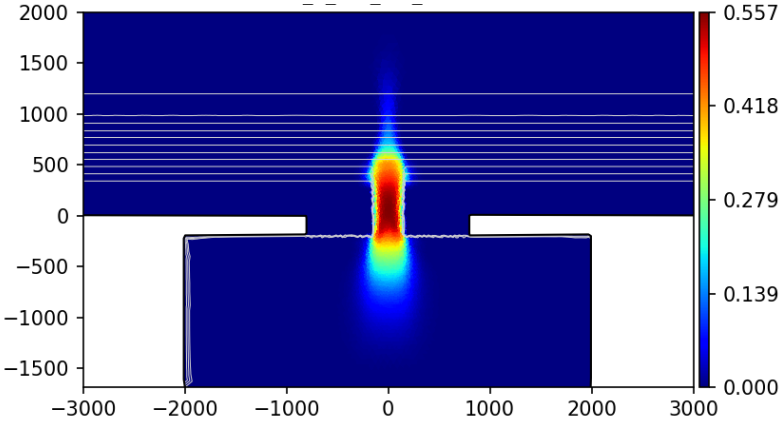
SSC mid water column

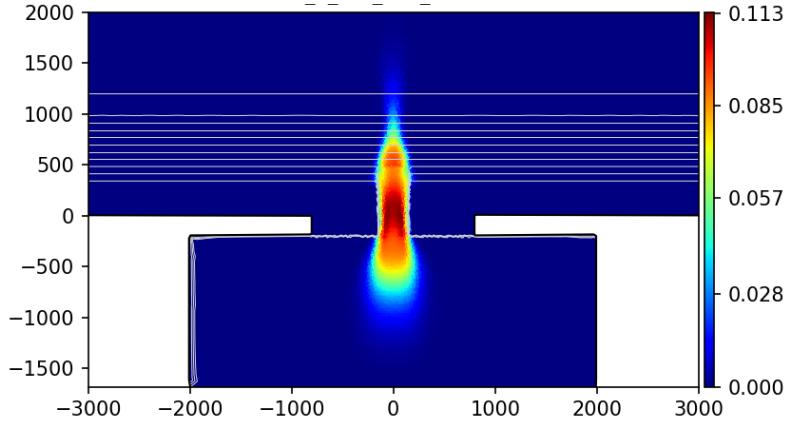
Ref deposition

New deposition









→ consistent distributions and orders of magnitude

→ larger SSC with the new deposition flux

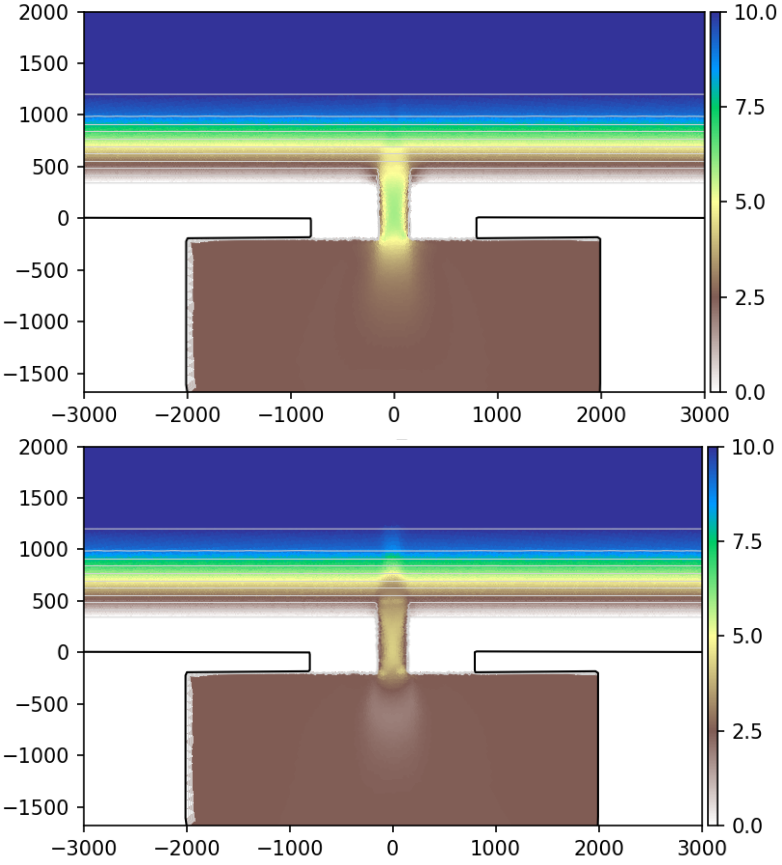
Bathymetric changes (m)

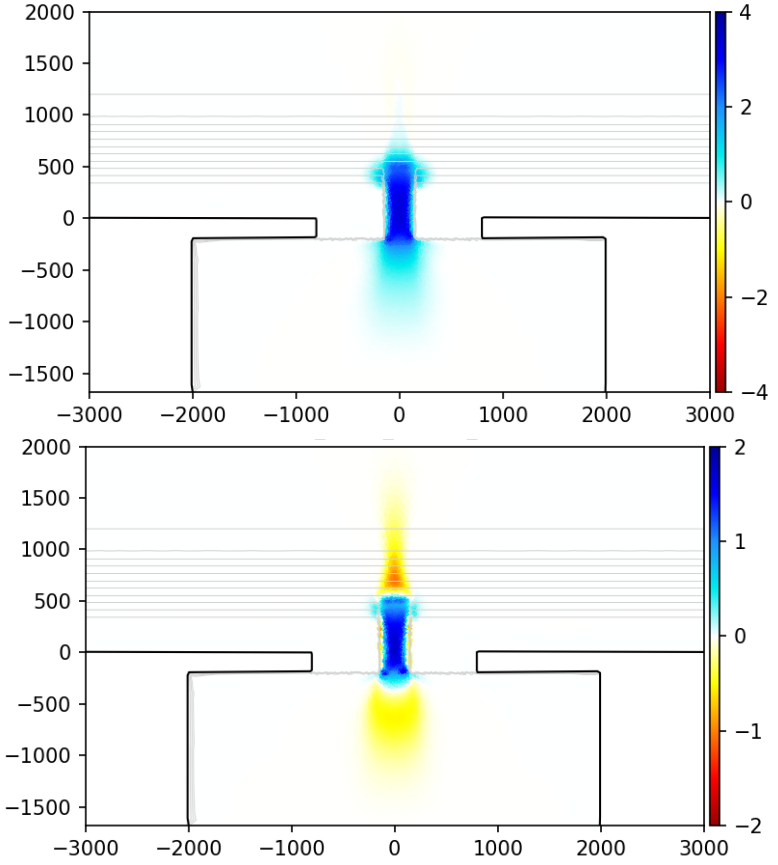
Final bathymetry

Depth change (final; erosion>0)

Ref deposition

New deposition





→ almost only erosion patterns derived with the reference deposition flux

→ new deposition flux: more coherent erosion/deposition patterns