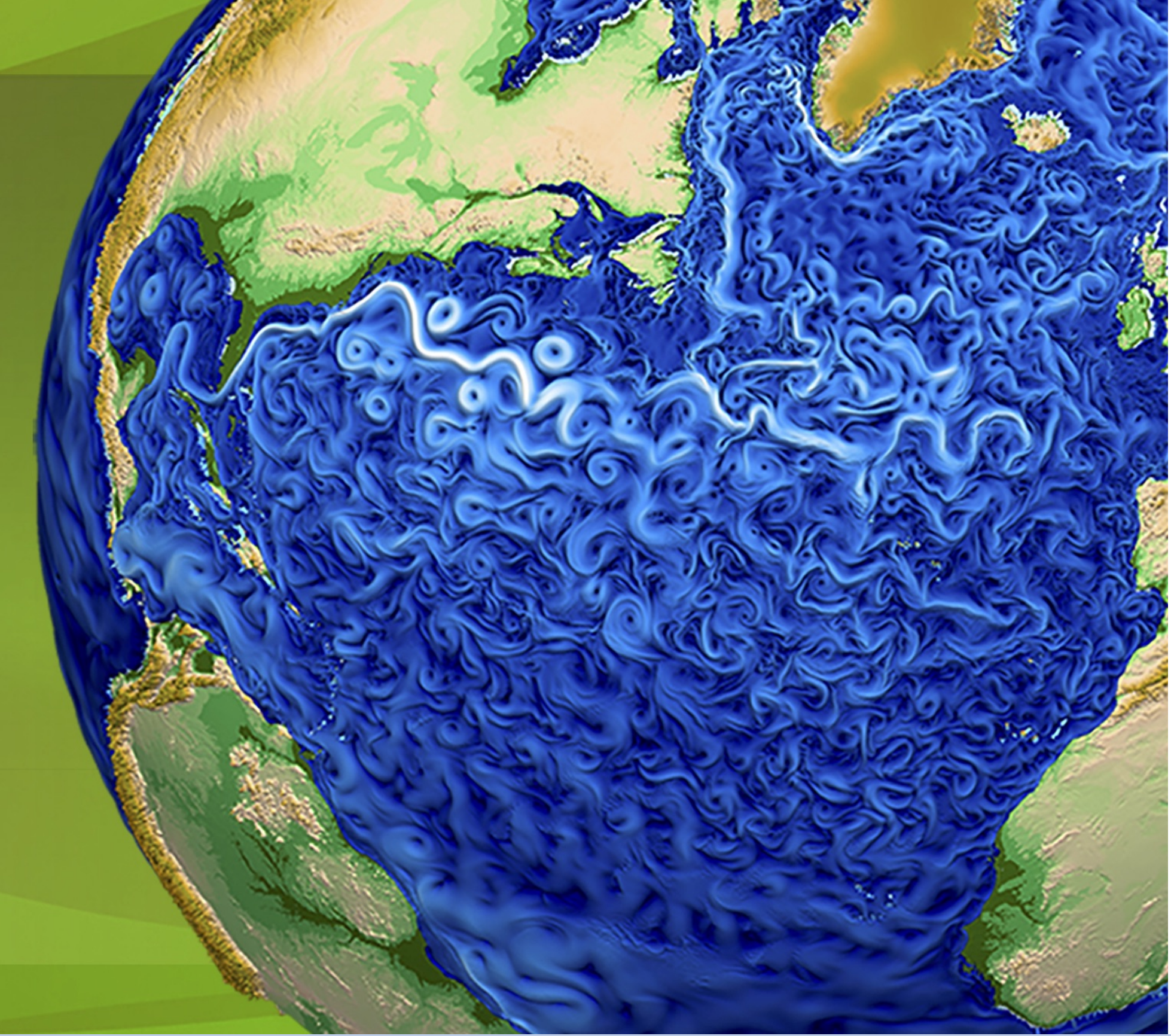


R: Biophysics development for the ACME Land Model Version 2

Gautam Bisht and William Riley

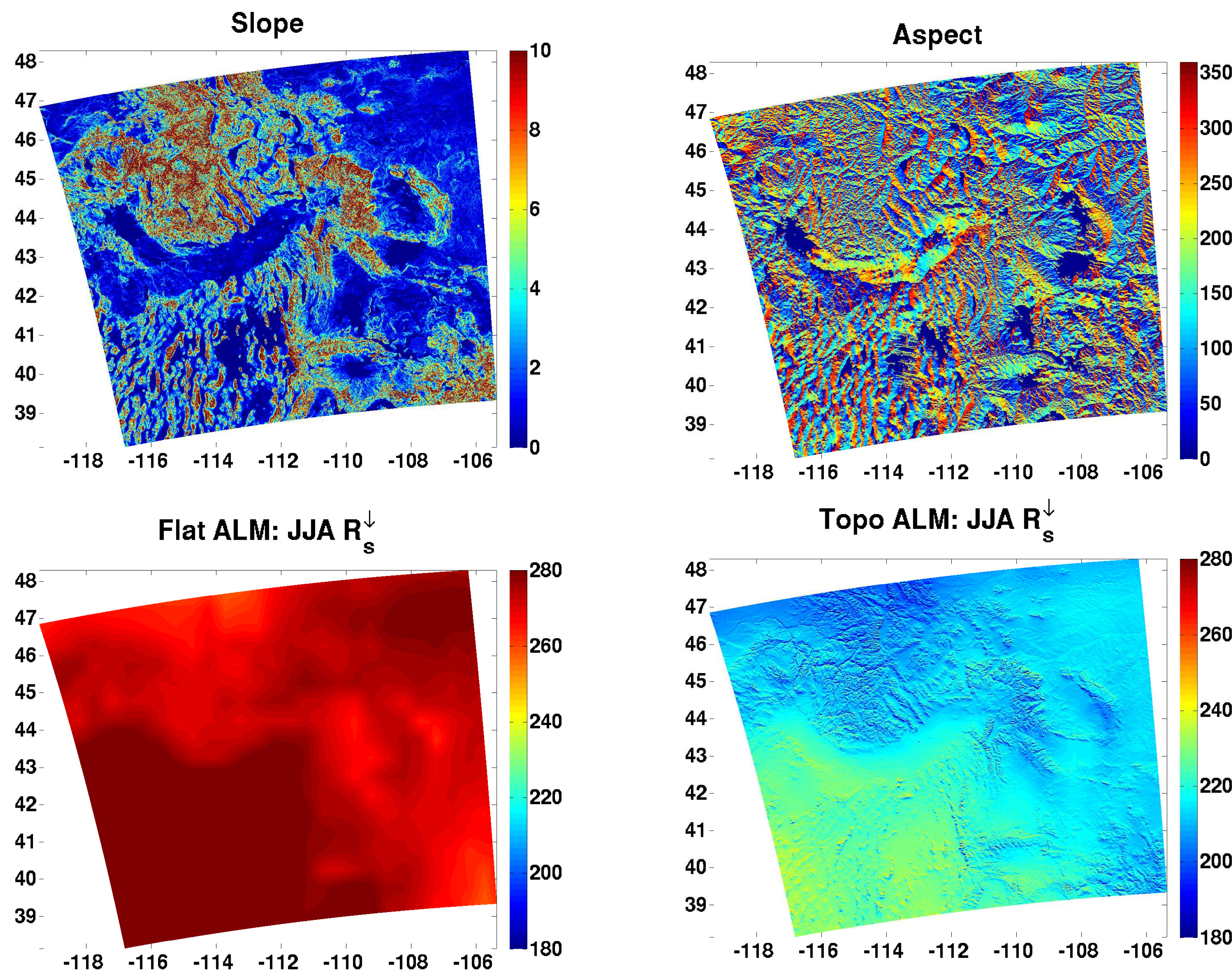


Objective

- ALM assumes that the Earth's surface is flat and has an unobstructed sky.
 - ALM neglects lateral fluxes of water.
 - Thermal model of ALM does not account for heat transfer associated with water movement
- Objective of this work is to overcome above-mentioned shortcomings.

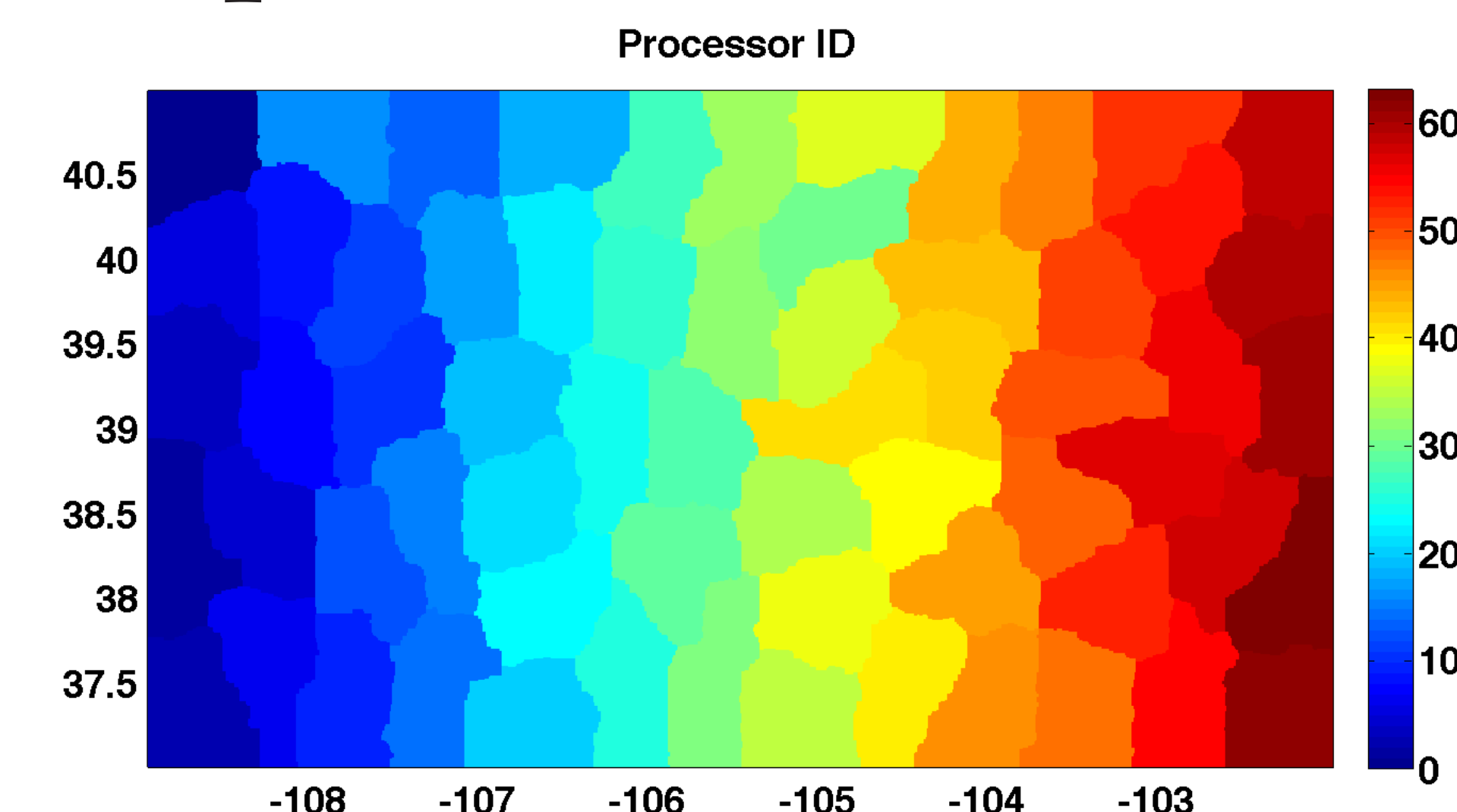
Topographic effects on surface radiation

- Created a 1 [km] ALM grid with 1000x1000 cells
- Slope and aspect obtained from GTOPO30
- Preliminary results show impact of topographic effects on downwelling shortwave radiation.

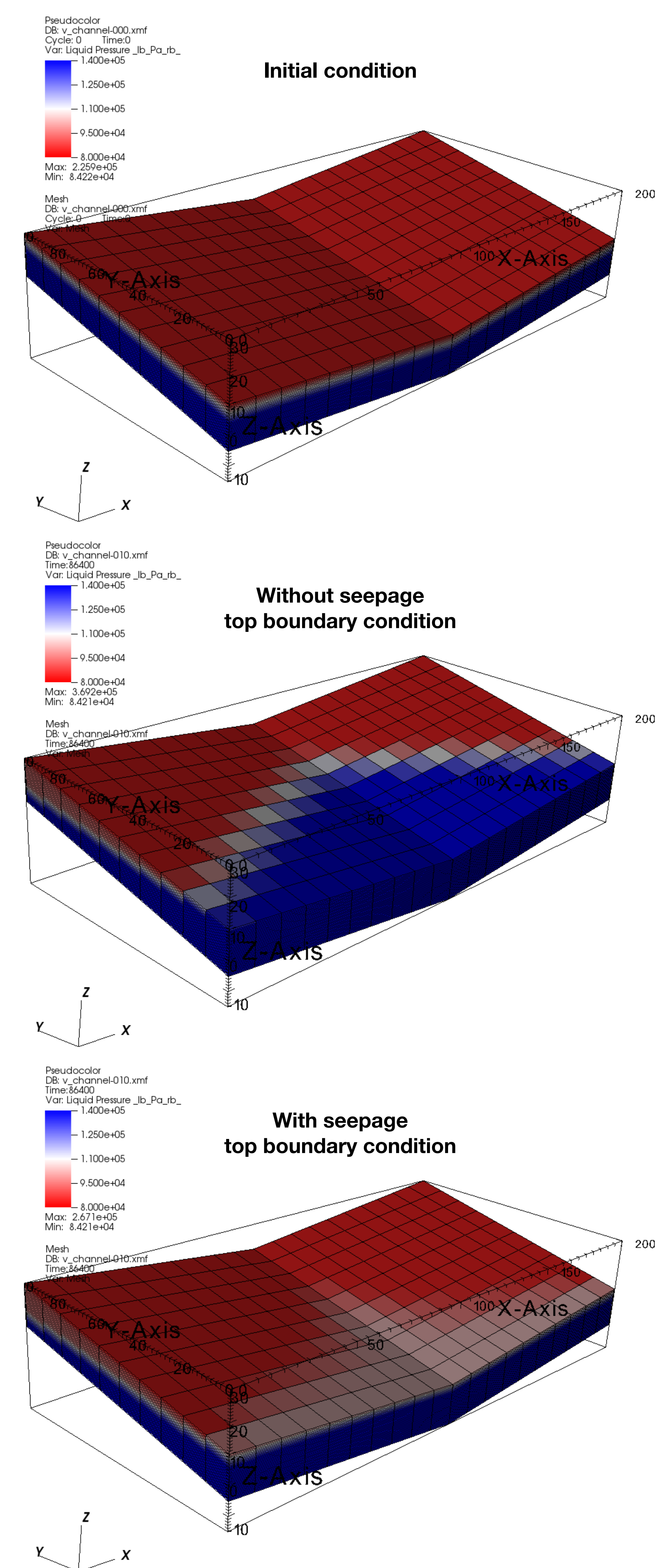


Subsurface later flux (LF) model

- Grid level topology is saved using MPAS mesh specification.
- ALM domain is decompose using ParMETIS as shown for 840x480 ALM grid on 64 processors



- LF models of various complexity are being explored
 - 1D PDE + LF source/sink
 - 1D PDE + LF PDE
 - 3D PDE



Multiphysics thermal model

Using PETSc's DMComposite()

