Separating the Physics and Dynamics Grids

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Outline

- Why yet another grid?
- What's the big deal?
- What's going on with interpolation?
- Status
- Initial Results

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- **Acknowledgments:** Peter Lauritzen, Mark Taylor

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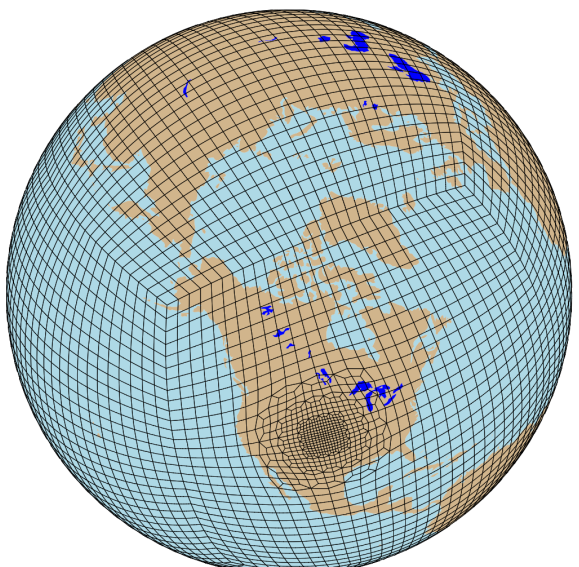
- Even worse grid spacing in regionally-refined grids



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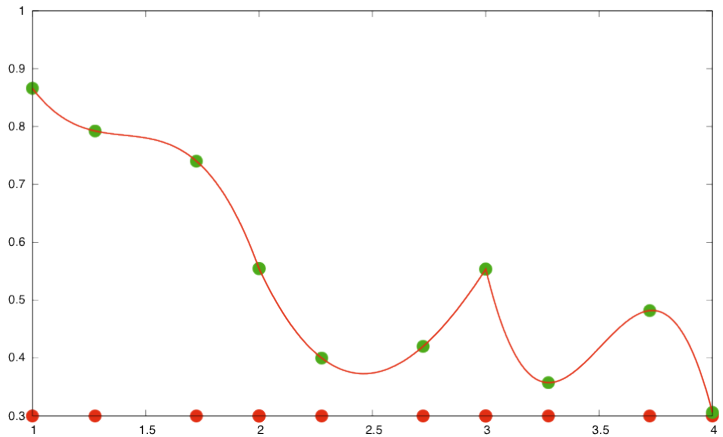

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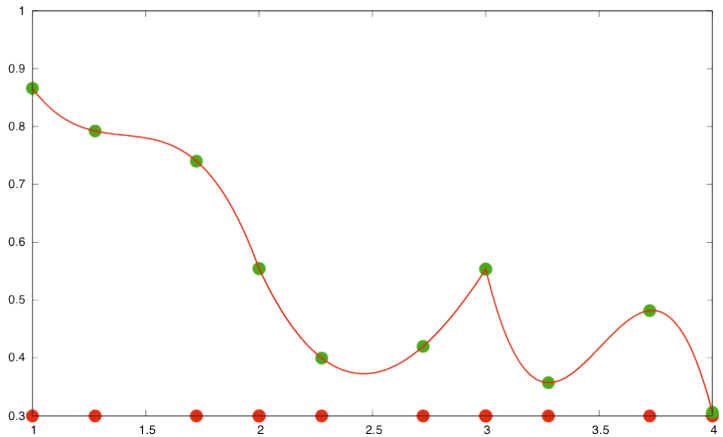

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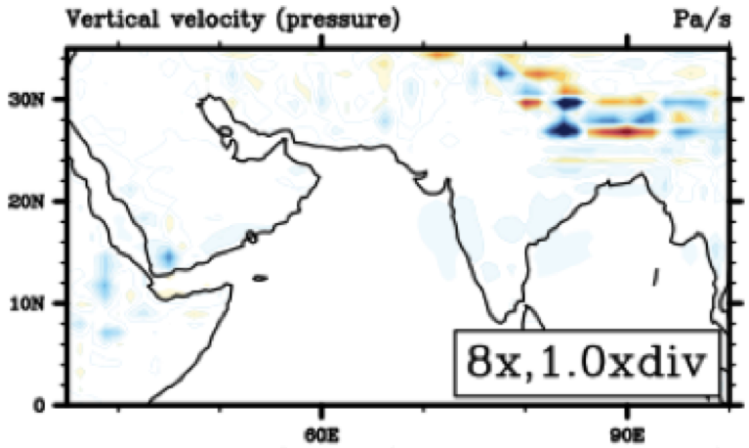

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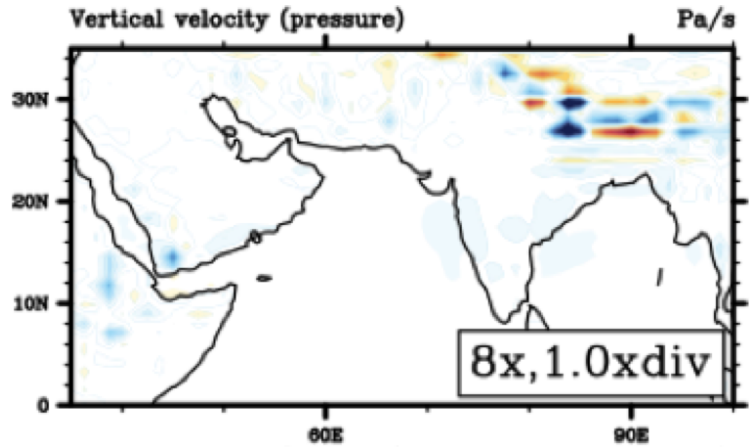

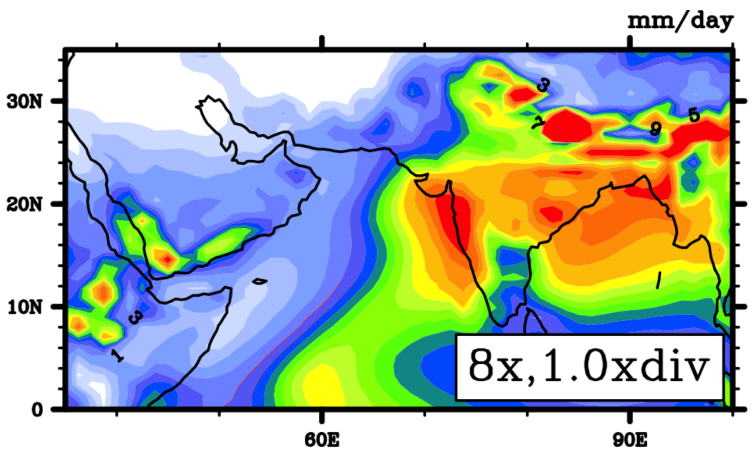

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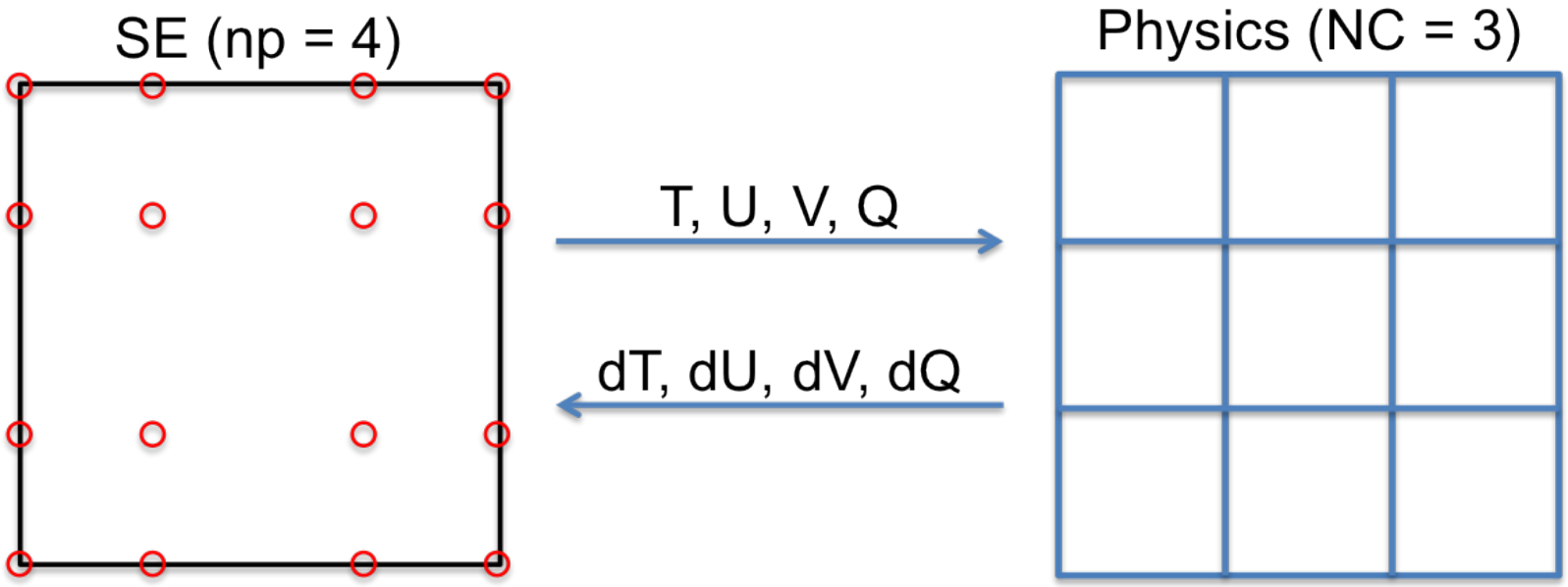
- New horizontal grids for CAM-SE with physics grid (e.g., NE30NP4NC3)

What's going on with interpolation?

Scheme for physics grid with GLL tracer advection



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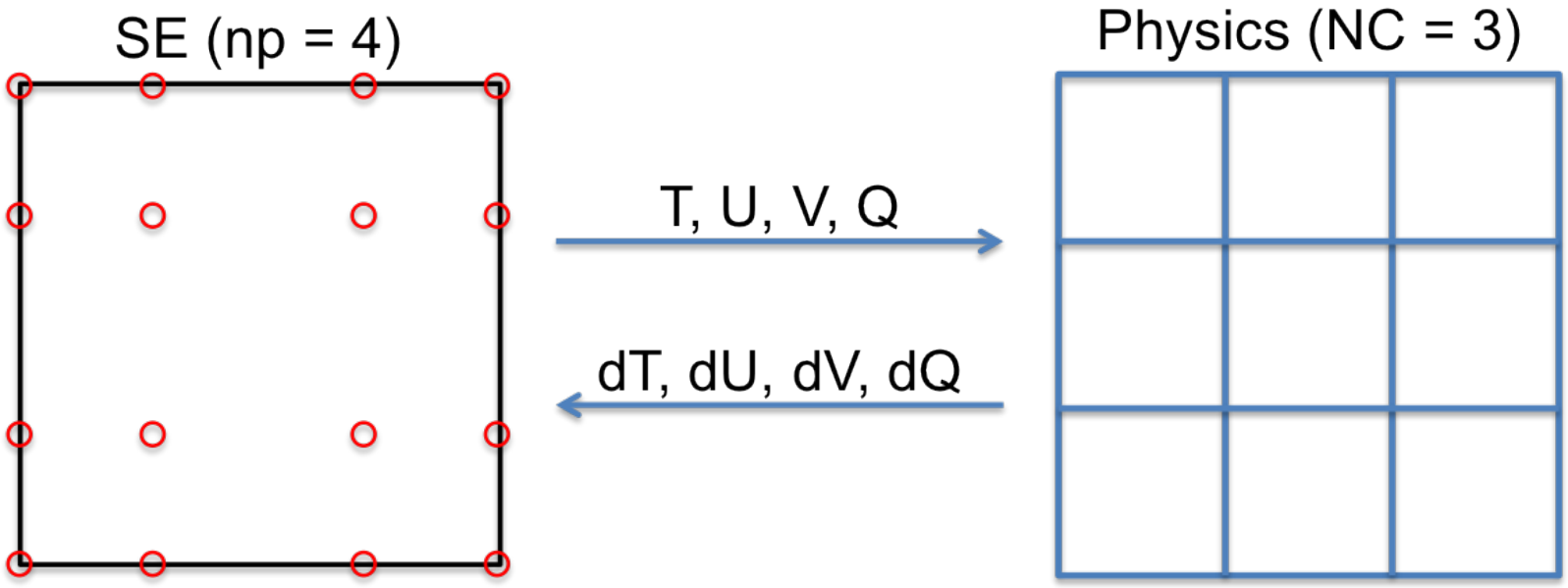

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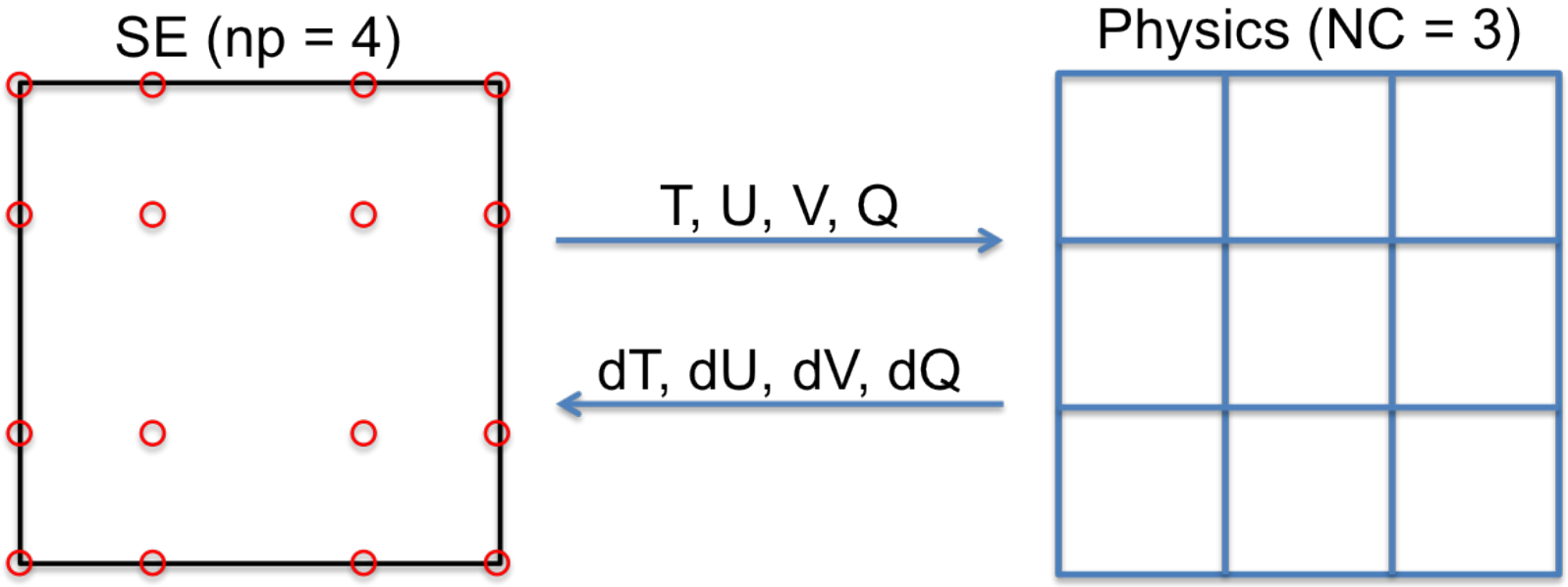

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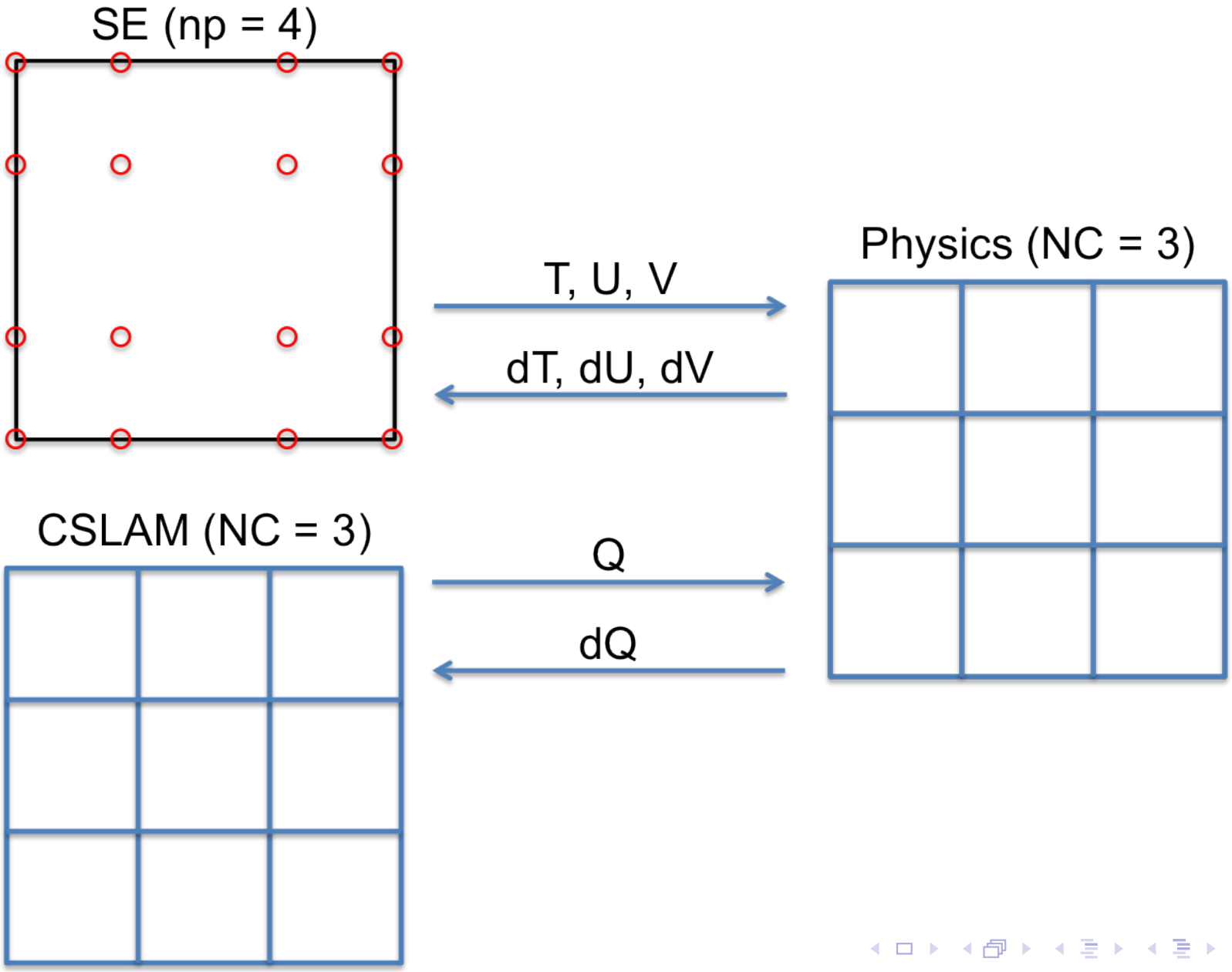
- Boundary exchange after interpolation from physics to dynamics equalizes SE edge points

Scheme for Physics grid with CSLAM



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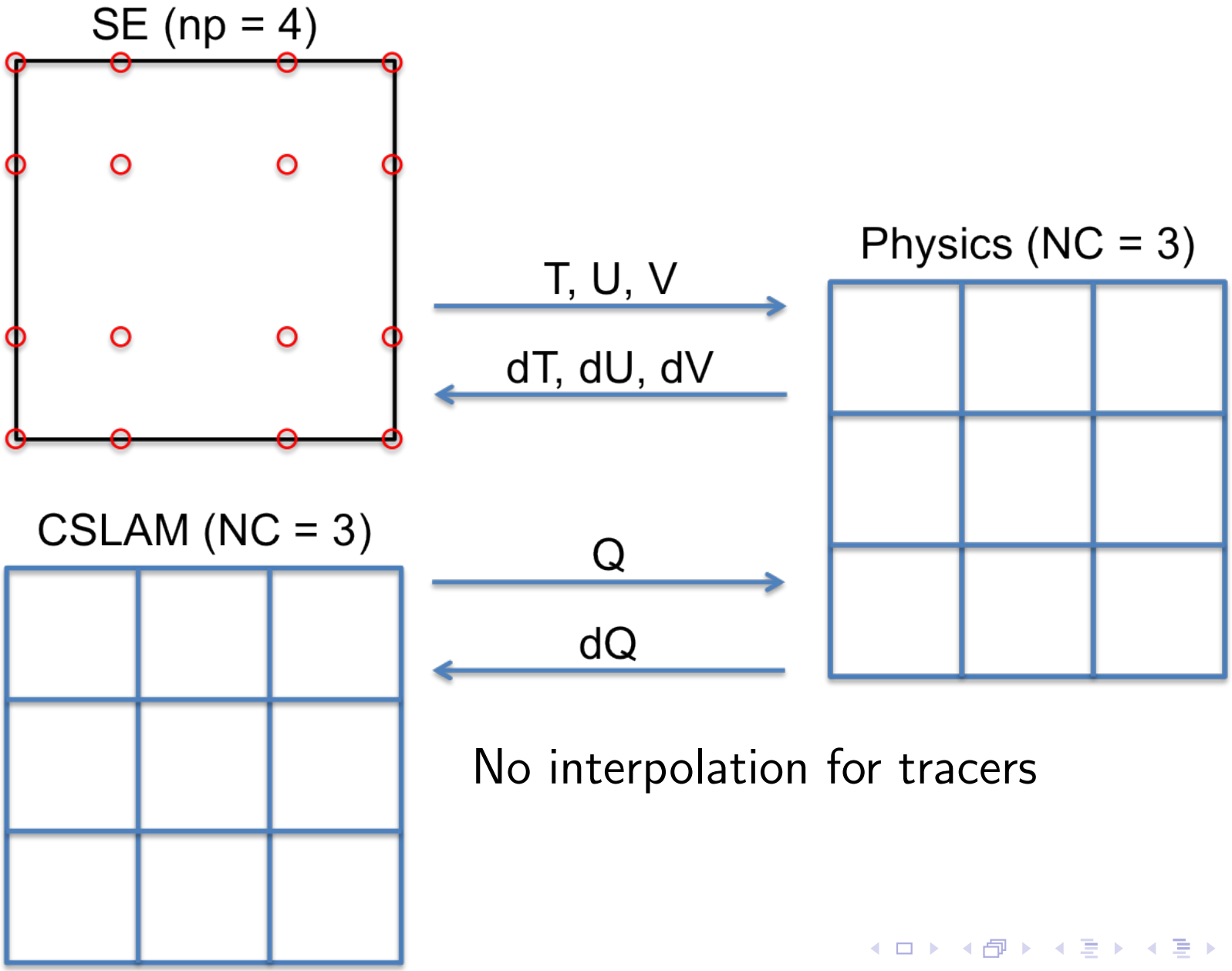

No interpolation for tracers

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- Experimenting with special case where the physics grid and the CSLAM grid are identical (3x3 or 4x4, set by namelist variables).

Future Work

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- Look into reading in an arbitrary physics grid (useful when dealing with refined dynamics grids)

Initial results – Ideal Physics

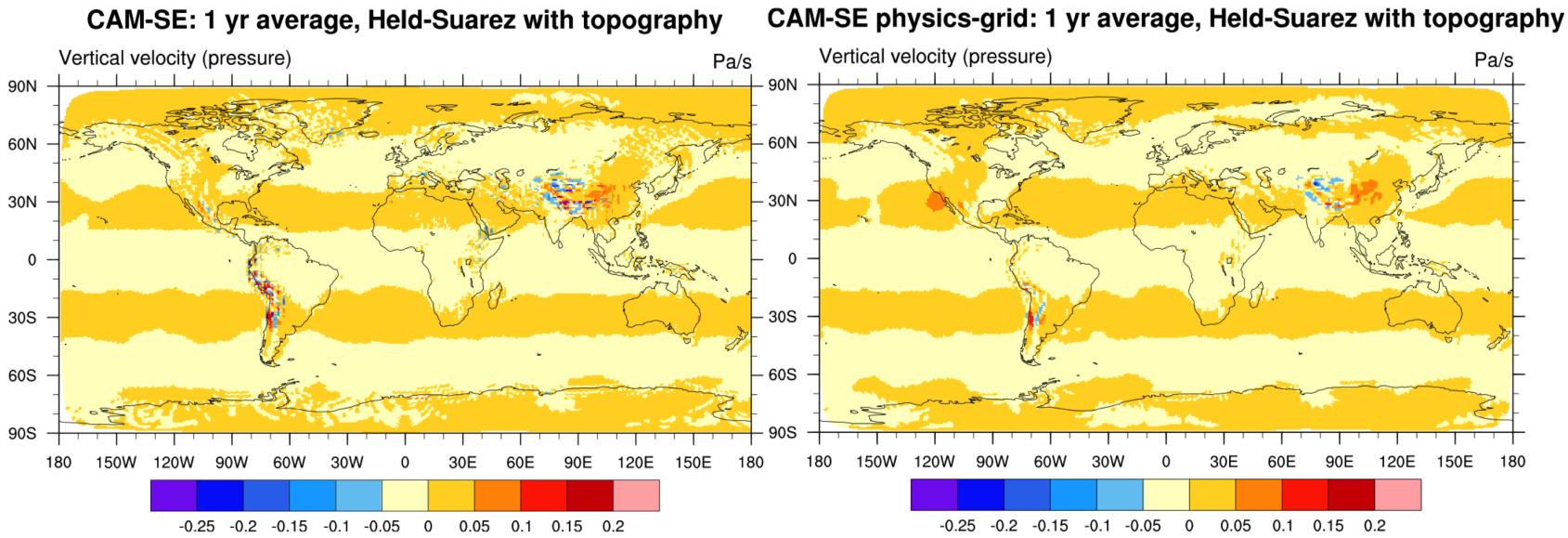
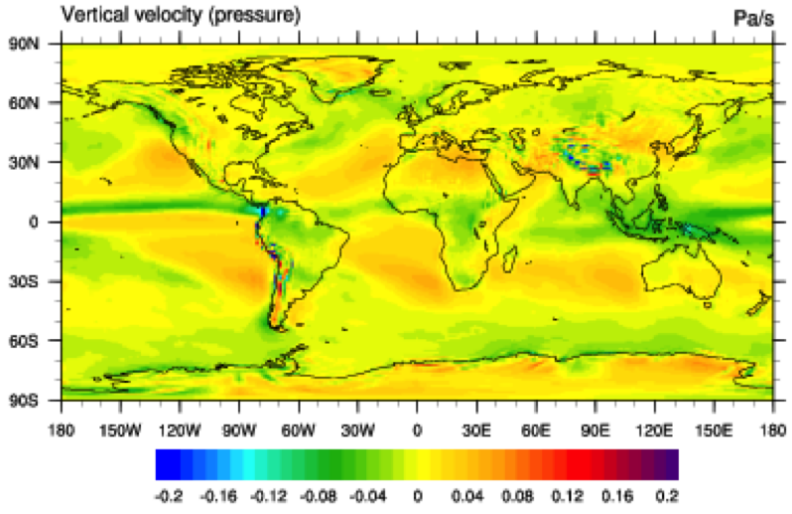


Figure acknowledgment: Peter Lauritzen

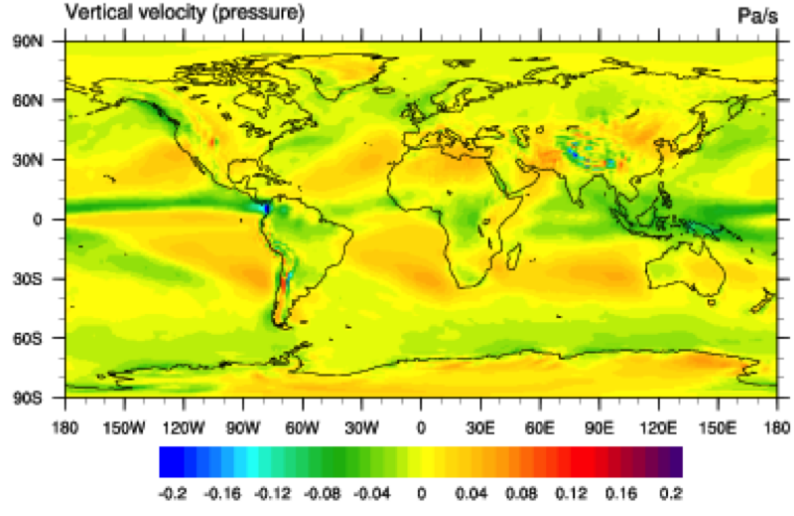
Initial results – NE30 F2000

Omega 500mb

CAM-SE



CAM-SE physics-grid



When using a 3x3 physics grid, cell averaged quantities reduce extrema seen by the physics. Vertical pressure velocity is less noisy near steep topography (Andes, Himalayas)

Figure acknowledgment: Mark Taylor

Thanks!

Questions?

Contact: goldy@ucar.edu