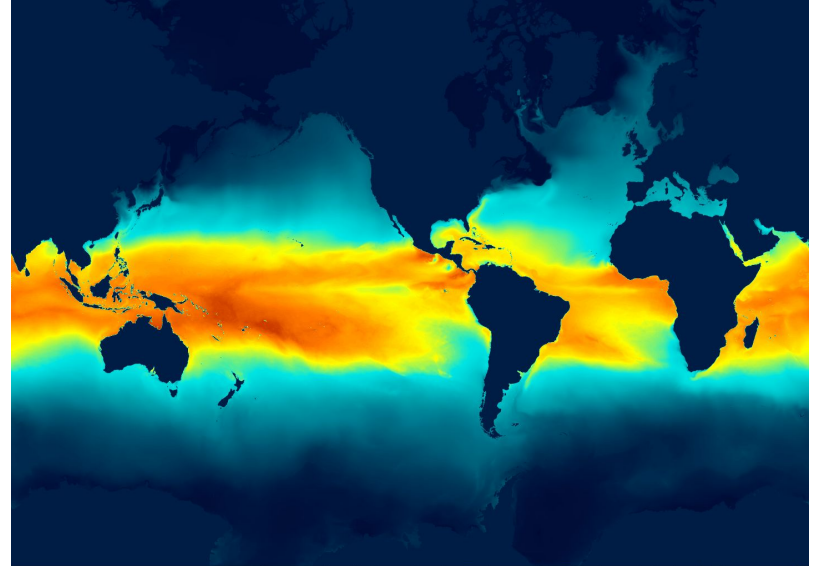# ECE4 at VHR

~10km - Tco639-ORCA12
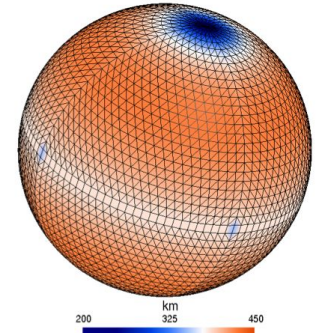
Why VHR?

- Facilitate **eddy-resolving** simulations
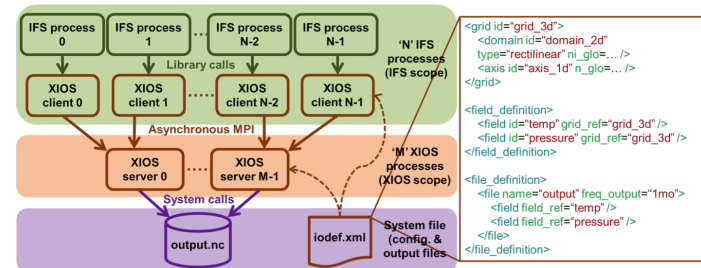
- Validate **technical** developments

ECE4-VHR: Improved efficiency and speed

- Octahedral reduced gaussian grid for OpenIFS

- Common asynchronous I/O server

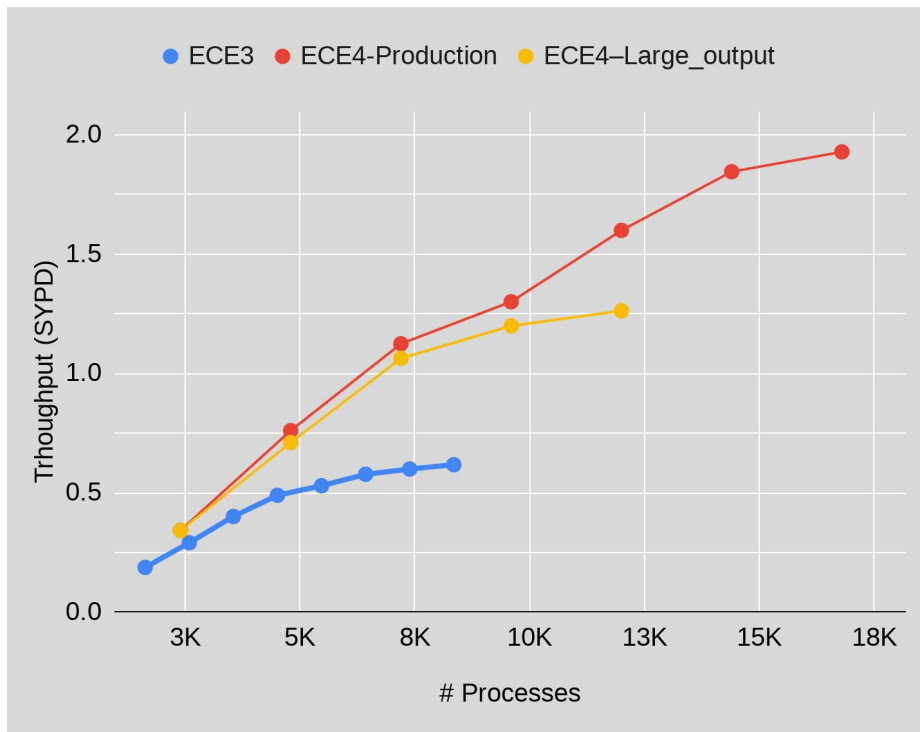- Improved NEMO (and SI3) scalability

N24 octahedral Gaussian grid

ECE4-VHR: Improved efficiency and speed

Configuration creation → easier and more efficient.

- **OCP tool** → OASIS coupler grids, masks & areas.

- **OpenMP OASIS** → Remapping weights (in parallel).

  - Independent process for every pair of source-target grids.

  - Tco639-ORCA12 → the process can be completed in a few hours.
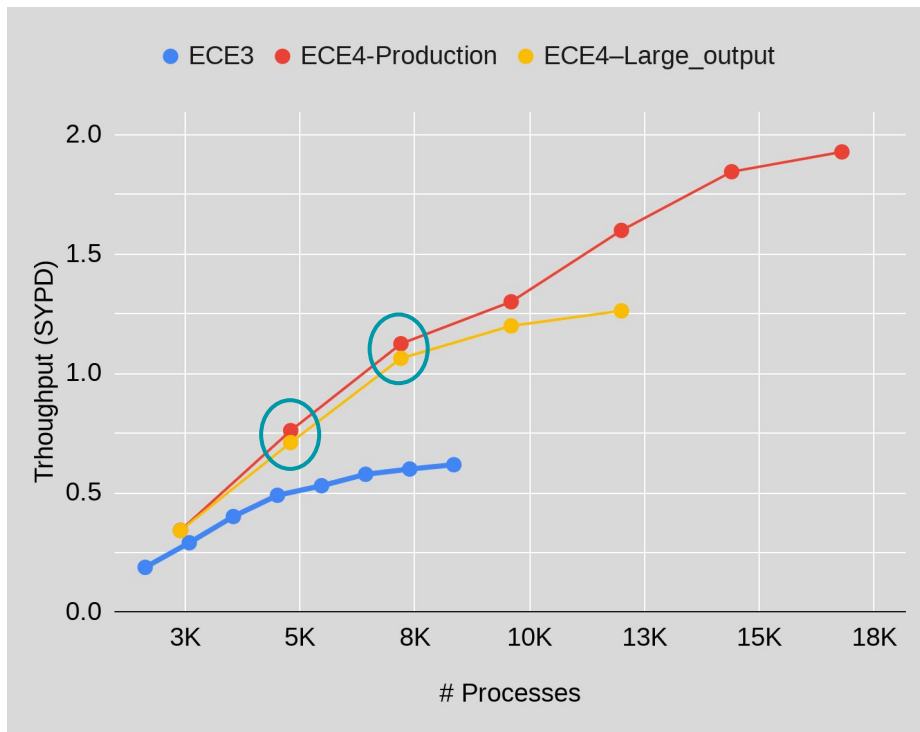
ECE4-VHR: Scalability

ECE3: TL1279-ORCA12

ATM: 360s, **OCE: 360s**, ICE: 720s, **CPL: 720s**

ECE4: Tco639-ORCA12

ATM: 360s, **OCE: 240s,** ICE: 720s, **CPL: 3600s**

- **Production: Monthly** output
- **Large output: 3-hourly** output

ECE4-VHR: Scalability

ECE3: TL1279-ORCA12

ATM: 360s, **OCE: 360s**, ICE: 720s, **CPL: 720s**

ECE4: Tco639-ORCA12

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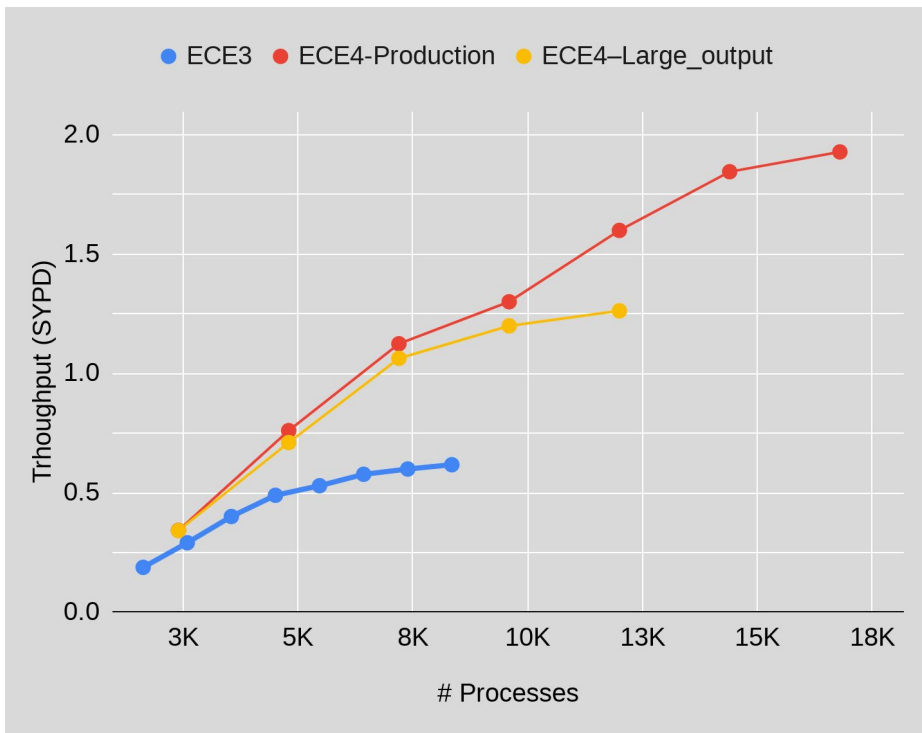# ECE4-VHR: Scalability

ECE3: TL1279-ORCA12

ATM: 360s, **OCE: 360s**, ICE: 720s, **CPL: 720s**

ECE4: Tco639-ORCA12

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- **Production: Monthly** output
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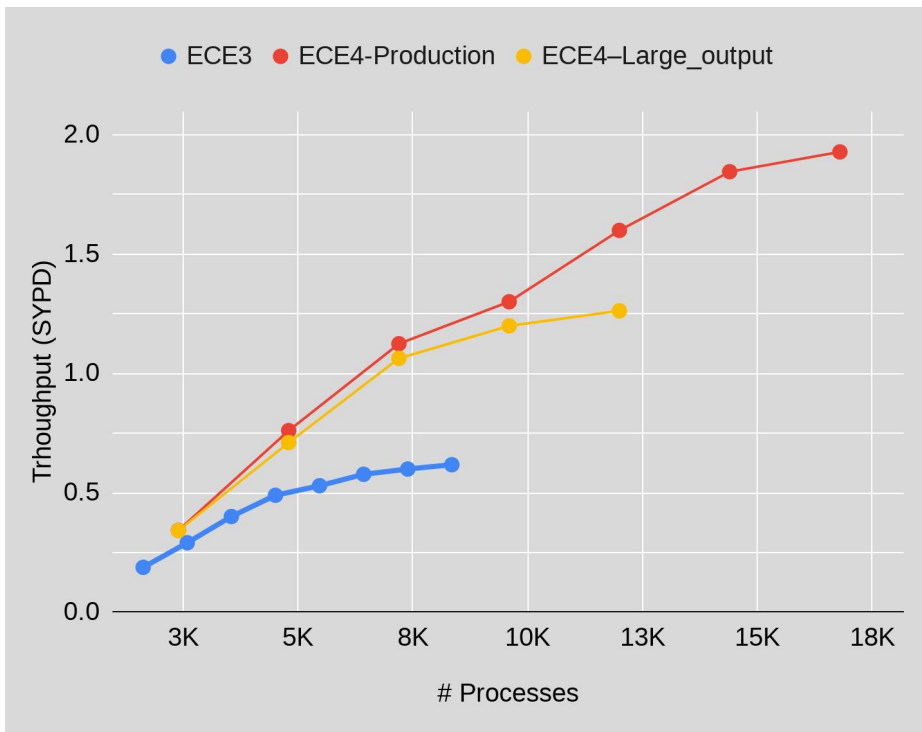# ECE4-VHR: Scalability

ECE3: TL1279-ORCA12

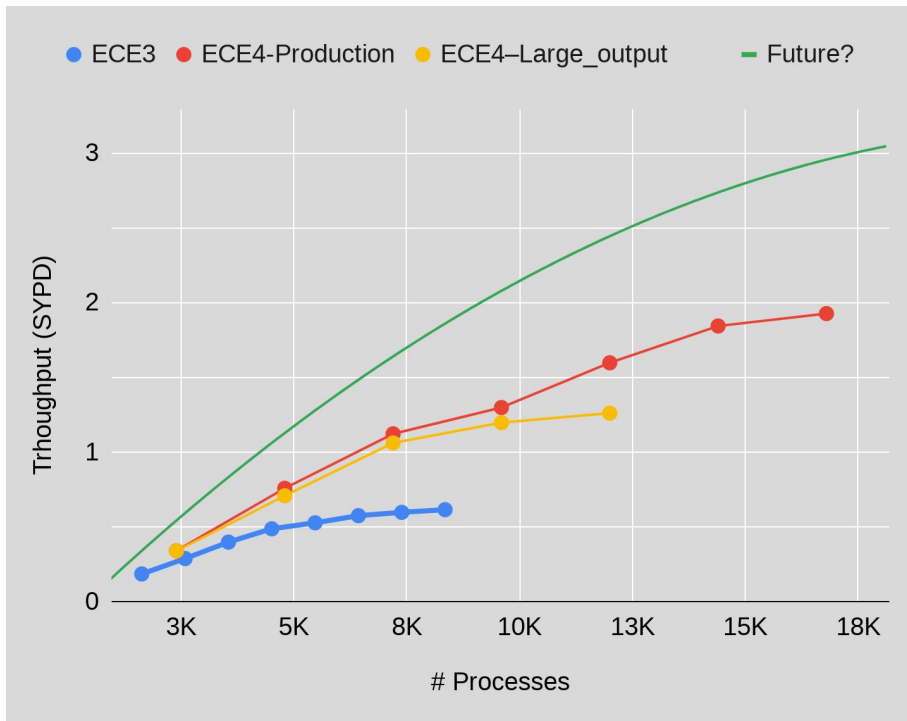ATM: 360s, **OCE: 360s**, ICE: 720s, **CPL: 720s**

ECE4: Tco639-ORCA12

ATM: 360s, **OCE: 240s,** ICE: 720s, **CPL: 3600s**

- **Production: Monthly** output
- **Large output: 3-hourly** output

MN4: Petascale (2017) machine!

ECE4-VHR: What do we aim for now?

Future projection

- Longer stepping

- New hardware (Pre-Exascale)

- Optimizations (mixed precision)

ECE4-VHR

I/O still is a **potential bottleneck** at 10km at higher-resolutions

More information at tomorrow's **XIOS BOG**