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Title:	Fast 3D Surface Extraction	2 pages (including abstract)
Author(s):	Sewell, Christopher Meyer Patchett, John M. Ahrens, James P.	
Intended for:	Highlight slide for SDAV project leadership	

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Abstract: Fast 3D Surface Extraction

- Ocean scientists searching for isosurfaces and/or thresholds of interest in high resolution 3D datasets required a tedious and time-consuming interactive exploration experience.
- PISTON research and development activities are enabling ocean scientists to rapidly and interactively explore isosurfaces and thresholds in their large data sets using a simple slider with real time calculation and visualization of these features.
- Ocean Scientists can now visualize more features in less time, helping them gain a better understanding of the high resolution data sets they work with on a daily basis.
- Isosurface timings (512^3 grid): VTK 7.7 s, Parallel VTK (48-core) 1.3 s, PISTON OpenMP (48-core) 0.2 s, PISTON CUDA (Quadro 6000) 0.1 s

Fast 3D Surface Extraction

Science Problem:

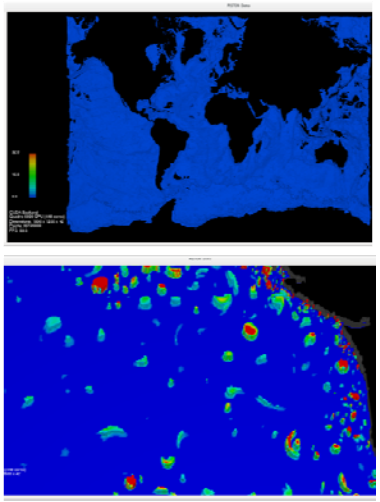
- Ocean scientists searching for isosurfaces and/or thresholds of interest in high resolution 3D datasets required a tedious and time-consuming interactive exploration experience

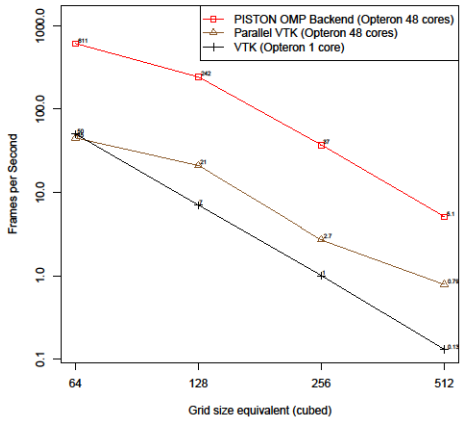
Our Solution:

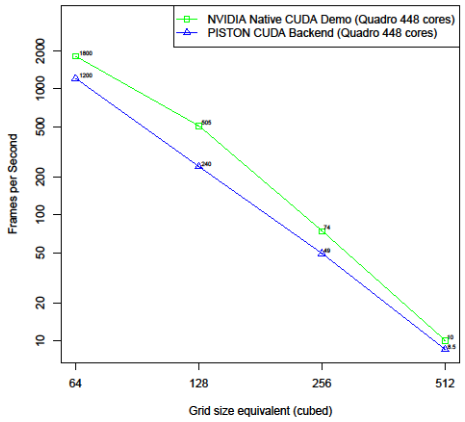
- PISTON research and development activities are enabling ocean scientists to rapidly and interactively explore isosurfaces and thresholds in their large data sets using a simple slider with real time calculation and visualization of these features

Results:

- Ocean Scientists can now use PISTON to visualize more features in less time, helping them gain a better understanding of the high resolution data sets they work with on a daily basis
- Isosurface timings (512^3 grid): VTK 7.7 s, Parallel VTK (48-core) 1.3 s, PISTON OpenMP (48-core) 0.2 s, PISTON CUDA (Quadro 6000) 0.1 s







(Upper left): Isosurface of POP ocean temperature data
(Lower left): Thresholds of Okubo-Weiss in POP ocean data
(Center left): PISTON OpenMP isosurface performance versus VTK and Parallel VTK
(Center right): PISTON CUDA isosurface performance versus NVIDIA Marching Cubes demo