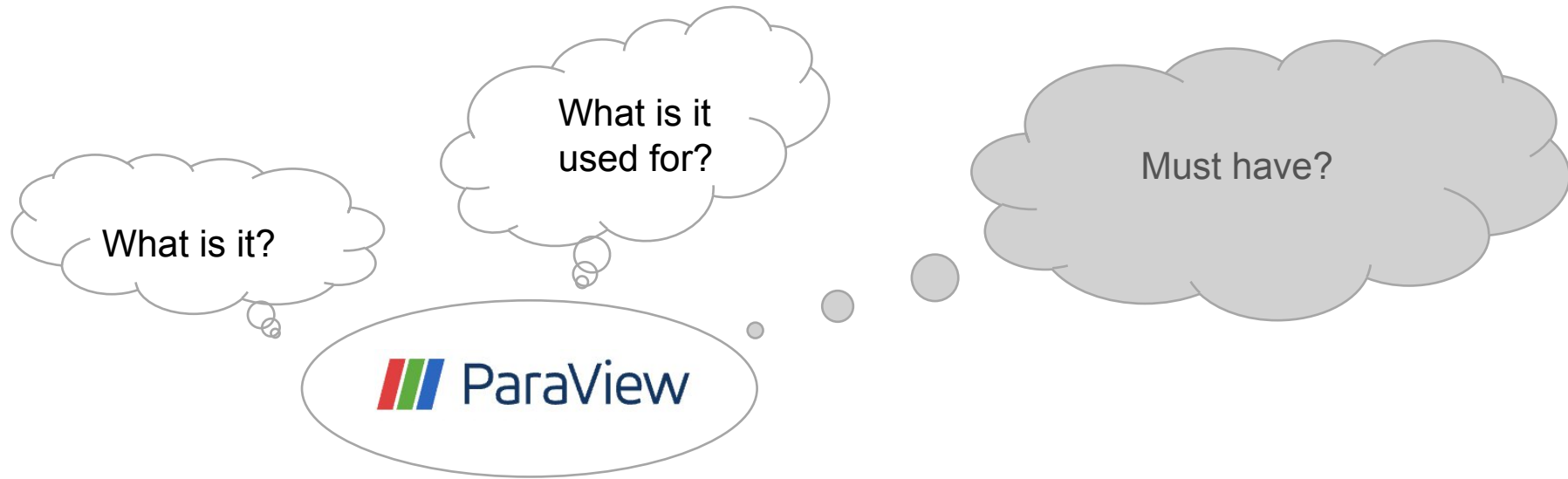


A glimpse on ParaView - visualisation of 4D gridded simulation output

GEOMAR Visualization Week

Klaus Getzlaff, Tobias Schulzki



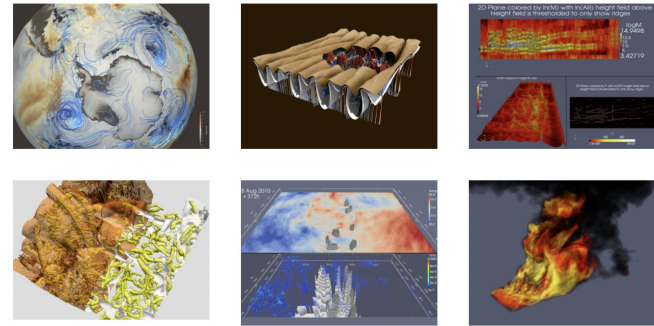
Let's have a look!

Examples!

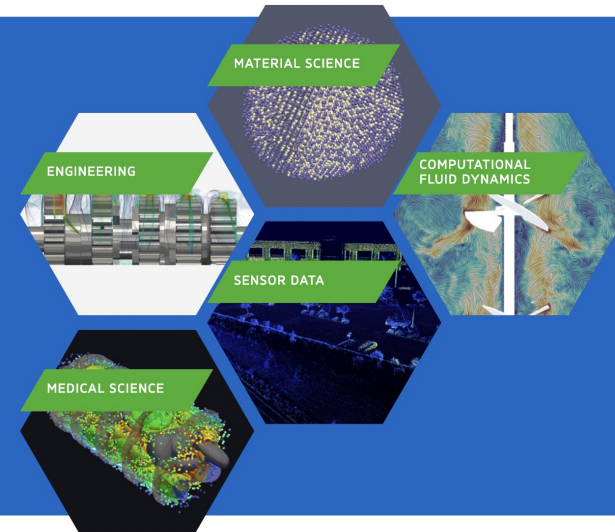
What is ParaView and what is it used for

GALLERY
See ParaView in
Action

- open-source software package for scientific visualization and data exploration
- designed for data parallelism on shared- or distributed-memory multicomputers and clusters
- client-server architecture for remote visualization of datasets
- supports [NetCDF](#) files and various other formats
- ParaView comes with [extensive documentation](#) and a [user forum](#)
- continuous development
- MPI and GPU enabled
- Python based scripting



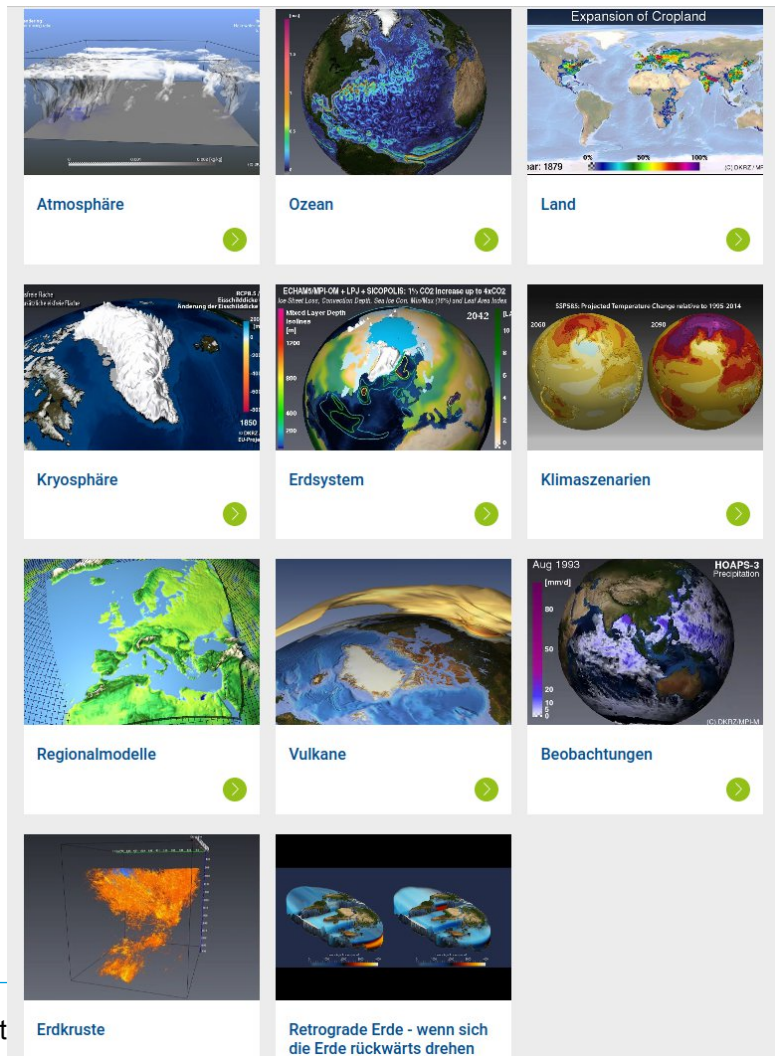
SOLUTIONS
See all the ways
you can use
ParaView



What is ParaView and what is it used for

- allows you to perform data exploration either interactively in 3D or using batch processing
- can run on anything from supercomputers to analyze exascale datasets to laptops for smaller-sized data
- an integral tool in many national laboratories, universities, and commercial settings

- DKRZ
 - regular workshops
 - [DKRZ's gallery](#)
 - [DKRZ's documentation](#)
- [ESiWACE EU project](#)
 - [HPDA trainings](#)



What is ParaView and what is it used for

- ...
- DKRZ
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- [ESiWACE EU project](#)
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Q Search the docs ...

- Getting started at DKRZ ▼
- Levante HPC system ▼
- Data Storage ▼
- Software & Services ▼
- Data Services ▼
- Visualization** ▲
- ParaView** ▲
 - ParaView on Levante
 - Paraview Examples ▼
 - DKRZ ParaView tutorial document
 - The Paraview main screen
 - Camera and perspective ▼
 - Colormaps ▼
 - Export ▼
 - Filters ▼
 - Light ▼
 - Readers ▼
 - Rendering Techniques ▼
 - Technical ▼
- VAPOR
- NCL ▼
- Python
- PyNGL
- GRADS

Documentation for visualization with Paraview

Start by having a look at [The Paraview main screen](#) or take a guided tour and [Create an image of sea surface speeds](#), or follow instructions in the [DKRZ ParaView tutorial document](#), a prototype of an ParaView tutorial document written at DKRZ.

Or chose from the full menu:

Tutorials and instructions:

- [ParaView on Levante](#)
 - [The paraview-internal solution](#)
 - [The Shell script solution](#)
 - [The VNC Solution](#)
- [Paraview Examples](#)
 - [Create an image of sea surface speeds](#)
 - [Display clouds as a semi-transparent overlay](#)
 - [Create isosurfaces of ocean current speed](#)
 - [Create a multi-variable image / animation from a coupled ice sheet - climate simulation](#)
 - [Prepare a regional land and ocean map background](#)
 - [Streamline seeding in vector data](#)
 - [Volume rendering of \(NARVAL II\) ICON data](#)
 - [Isosurfaces and isocontours in regular lat-lon data](#)
- [DKRZ ParaView tutorial document](#)
- [The Paraview main screen](#)
- [Camera and perspective](#)
 - [Set the background \(color/gradient\)](#)
 - [Camera: Follow Path](#)
 - [Camera: Orbit](#)
 - [Switch to camera parallel projection](#)
 - [Camera: Interpolate camera locations](#)
 - [Set the view size](#)
- [Colormaps](#)
 - [Hack the color map:](#)
 - [Chose a different colormap](#)
 - [Invert the Colormap](#)
 - [Adjust the color bar and its legend](#)

☰ On this page

Documentation for
visualization with Paraview

What is ParaView and what is it used for

- ...
- DKRZ
 - regular workshops
 - [DKRZ's gallery](#)
 - [DKRZ's documentation](#)
- [ESiWACE EU project](#)
 - [HPDA trainings](#)

The screenshot shows a GitHub repository page for 'ESiWACE / hpda-vis-training'. The repository is public and has 4 stars and 1 fork. The current branch is 'master'. The commit history shows a commit by 'eldoo' titled 'Add slides for session1 and session2' 20 days ago. The commit message is 'Add slides for session1 and session2'. The commit includes a folder structure with 'Session1', 'Session2', 'Session3', and 'Session4', and a 'README.md' file. The 'README.md' file content is displayed below the commit history.

Training on HPDA and Visualisation 2022

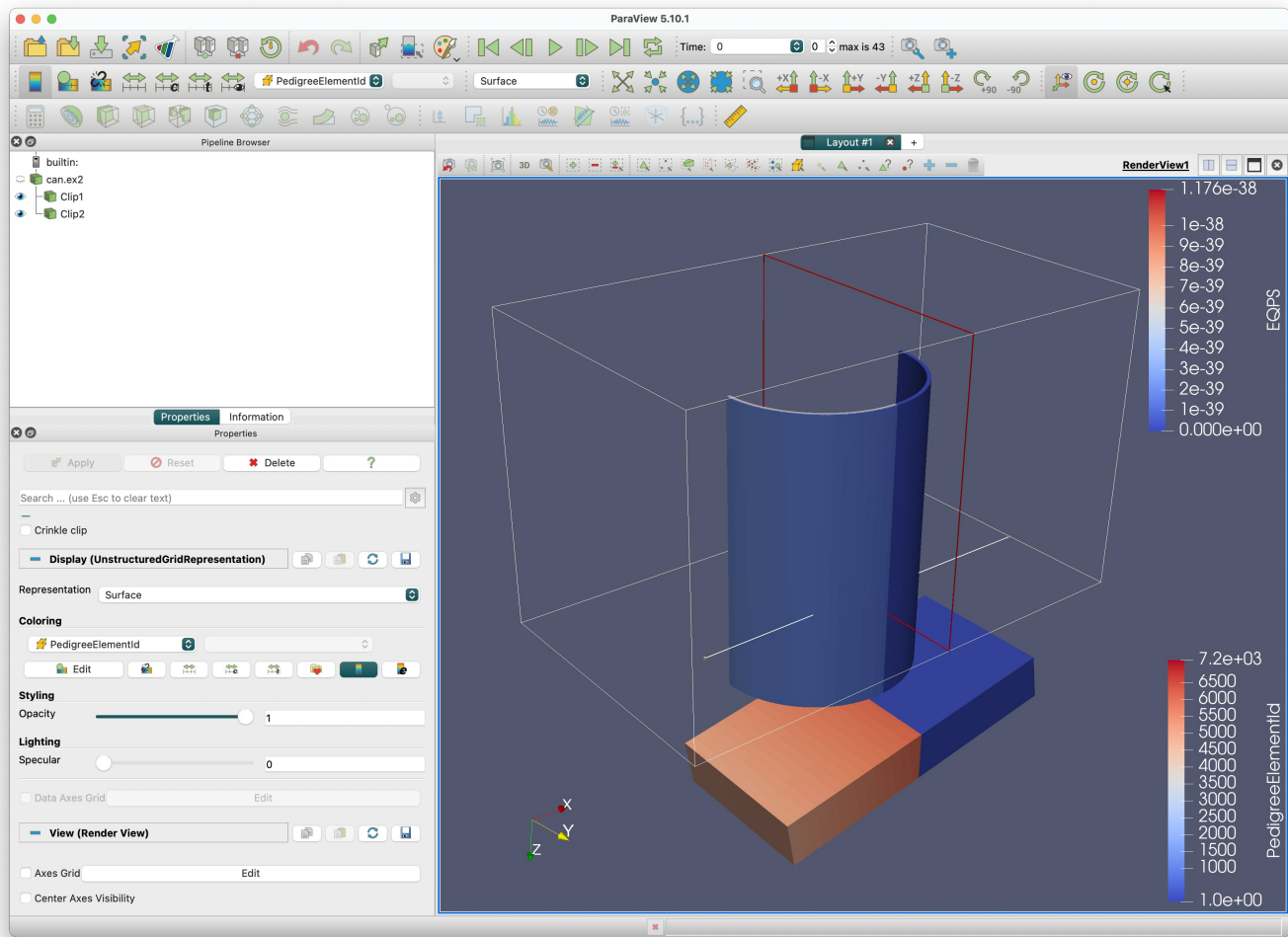
This folder contains the training material for the 2022 ESiWACE2 Online Training Course on HPDA and Visualisation (<https://indico.dkrz.de/event/43/>).

Agenda for ESiWACE2 HPDA and Visualisation Course 2022

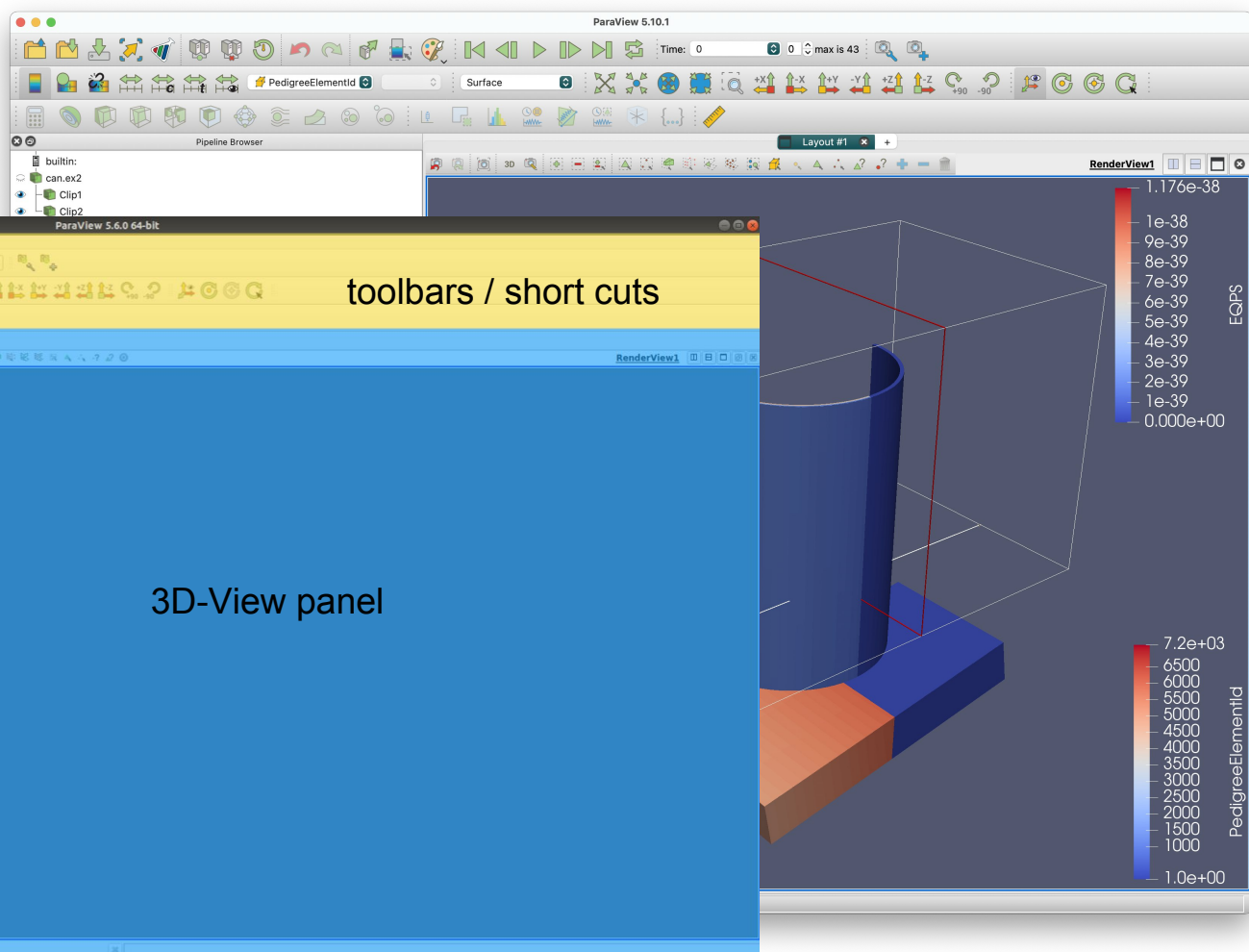
- Session 1: HPDA with Ophidia introduction - 6 September 2022 [14:30 - 16:30 CEST]
- Session 2: HPDA with Ophidia advanced - 7 September 2022 [14:30 - 16:30 CEST]
- Session 3: Visualization with Paraview introduction - 8 September 2022 [14:30 - 16:30 CEST]
- Session 4: Visualization with Paraview advanced - 9 September 2022 [14:30 - 16:30 CEST]

Each subfolder contains material associated with the corresponding session.

Let's have a look!



Let's have a look!



Let's have a look!

- git demo repository
 - state files
 - input data
 - final animation
 - step-by-step tutorial

The screenshot shows a GitHub repository page for 'ParaView_demo'. At the top, the breadcrumb navigation is 'visualisation_general > ParaView_demo > Repository'. Below this, there are navigation buttons: 'master' (selected), 'ParaView_demo /', '+', 'History', 'Find file', 'Web IDE', a download icon, and 'Clone'. A recent commit is shown: 'add link to animations in gallery' by Klaus Getzlaff, authored 1 minute ago, with commit hash 'c327dd04'. Below the commit list is a table of repository files and folders.

Name	Last commit	Last update
Colormaps	Include used colormaps	3 years ago
ParaView_Tutorial	add acknowledgement to tutorial	2 years ago
Python_scripts	Add python scripts	3 years ago
Statefiles	add animation to Demo_SPEED_SSH_ICE*...	5 minutes ago
gallery	add animation to Demo_SPEED_SSH_ICE*...	5 minutes ago
input	replaced links with physical nc-files	3 years ago
.gitattributes	add demo input nc-files as git lfs	3 years ago
README.md	add link to animations in gallery	1 minute ago

Below the table, the 'README.md' file is expanded, showing the following text:

README.md

A simple demo to run ParaView with all necessary *input data* and *state file*

Tutorial is available [here](#)

Statefiles for different visualisations are available [here](#)

Animations for different visualisations with statefiles are available [here](#)

Examples!

- from git [ParaView_demo_repository](#)
- [5-daily sea surface temperature](#) projected on surface elevation combined with sea ice cover from the high-resolution VIKING20X simulation for the period 2012 to 2018 in the framework of RACE
- [5-daily near-surface speed](#) (100m depth) projected on surface elevation combined with sea ice cover from the high-resolution VIKING20X simulation for the period 2000 to 2009 in the framework of iAtlantic EU project
- sea surface temperature projected on surface elevation combined with sea ice cover in combination with cloud coverage and wind speed in the atmosphere from an [FOCI](#) simulation
- combine different parameters sea-ice cover, mixed-layer depth and temperature in one [visualization](#)
- combine different parameters sea-ice cover, mixed-layer depth, temperature together with overflow water masses in one [visualization](#)

Must have?

pro

- designed to state-of-the art visualizations
 - stakeholders
 - outreach
 - science
- open-source software
- really powerful application (interactive/batch)
- large community
- some HPCs/project give support

con

- time consuming
 - at least to start without fundamental training
- resources (hardware) intense

Links

- ParaView [website](#)
- ParaView on [Wikipedia](#)
- ParaView user tutorials on [youtube](#)
- ParaView documentation at [DKRZ](#)

- GEOMAR git [ParaView_demo repository](#)
- example visualizations on oceanrep:
 - [5-daily sea surface temperature](#)
 - [5-daily near-surface speed](#)