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Visualisation of large datasets with Paraview

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With growing computing power, simulations become more sophisticated and higher resolutions can be handled. Together with the increasing use of parallel computers, this leads to large amounts of data. This data explosion is posing mounting difficulties in the post-processing and visualisation phase of modern simulations. Whereas large-scale simulations nowadays can often be split up on parallel computers, standard visualisation methods still tend to operate under the traditional sequential computing paradigm and hence the visualisation process must deal with the entire dataset at once. Thus often it does not fit even on quite large PCs. In our investigations, we found that the new open-source parallel visualisation program Paraview instead is quite a good tool — it has a very flexible architecture allowing it to run on a computing cluster, so that even large datasets can be handled. Additionally, interactive processing of the data, hardware-acceleration and optionally 3D on a Geowall are supported. This makes it suitable for processing large-scale geophysical simulations like high-resolution geodynamic or seismic simulations with isosurfaces, cross sections and topography (examples are provided).