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In-situ visualization in computational fluid dynamics using open-source tools: Integration of Catalyst into *Code_Saturne*. (English) [Zbl 1334.76118](#)

Bennett, Janine (ed.) et al., Topological and statistical methods for complex data. Tackling large-scale, high-dimensional, and multivariate data spaces. Selected papers based on the presentations at the workshop on the analysis of large-scale, high-dimensional, and multivariate data using topology and statistics, Le Barp, France, June 12–14, 2013. Berlin: Springer (ISBN 978-3-662-44899-1/hbk; 978-3-662-44900-4/ebook). Mathematics and Visualization, 21-37 (2015).

Summary: The volume of data produced by numerical simulations performed on high performance computers is becoming increasingly large. The visualization of these large post-generated volumes of data is currently a bottleneck for the realization of engineering and physics studies in industrial environments. In this context, Catalyst is a prototype in-situ visualization library developed by Kitware to help reduce the data post-treatment overhead. Additionally, *Code_Saturne* is a Computational Fluid Dynamics code developed by EDF, one of the largest electricity producers in Europe, for its large scale simulations. Both Catalyst and *Code_Saturne* are open-source software. In this chapter, we present a case study where Catalyst is coupled with *Code_Saturne*. We evaluate the feasibility and performance of this integration by running several use cases in one of our corporate supercomputers.

For the entire collection see [\[Zbl 1304.54001\]](#).

MSC:

[76M27](#) Visualization algorithms applied to problems in fluid mechanics

[76-04](#) Software, source code, etc. for problems pertaining to fluid mechanics

Software:

[Catalyst](#); [Code_Saturne](#); [HDF5](#); [ParaView](#); [SALOME](#); [VisIt](#)

Full Text: [DOI](#)