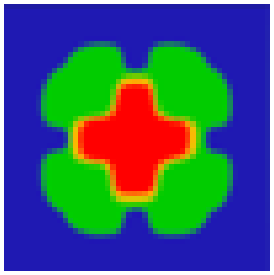

Contribution ID: **20** Type: **Contributed talks**

deal.II interface with CAD date structures: description, results and open issues

To exploit the automated mesh generation and adaptive refinement capabilities offered by deal.II, the user must provide its program with a suitable description of the domain geometry. In particular, it is fundamental that the geometries of boundary and internal surfaces are available to the triangulation so that the nodes generated across each mesh refinement are placed onto such surfaces, in a way that preserves mesh quality. This task is currently carried out by the manifold classes. A wide variety of manifold descriptors for the most common analytical geometries is available in the library. Along with such useful instruments, a set of manifold descriptors which import and interrogate CAD files has been implemented to treat also arbitrary geometries. All such manifolds are based on wrappers of functions constrained in the OpenCASCADE library, that are included in the corresponding deal.II namespace. This contribution will discuss such manifold descriptors and their working principles, mentioning relevant details of their implementation and providing examples and results of their applications. The discussion will then move to a series of open issues which currently limit the OpenCASCADE manifolds computational efficiency.

Primary author: Dr MOLA, Andrea (SISSA)

Presenter: Dr MOLA, Andrea (SISSA)

Track Classification: Users' track