

A link between CAD models and physics codes

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Many physics codes need a “mesh” or other geometrical abstractions of “machine description” as input that can be extracted from “detailed” CAD models available. The *mesh* is then used for calculating different physics and the results are stored in an “appropriate” database. The scientific workflow for which the CAD model is prepared, *meshed* and then stored as input to be used by the code should be made easier and more efficient for retrieval and reuse with emphasis to data provenance. A link between CAD models and physics codes is being developed and will provide a programmatic access within scientific workflows that will be more flexible regarding input control and scenarios for different machines. In this paper we describe the process of CAD geometry modelling from simplified to complex geometries with different *levels of details* defined as a service to the code. Furthermore, meshing of the geometry for visualisation purposes and storage of the mesh and attributes in a general grid description (GGD) is provided automatically. 3D codes for RWM, heat flux, fast particle simulations, and 2D SOL, or core can be directly linked to the presented CAD interface library.

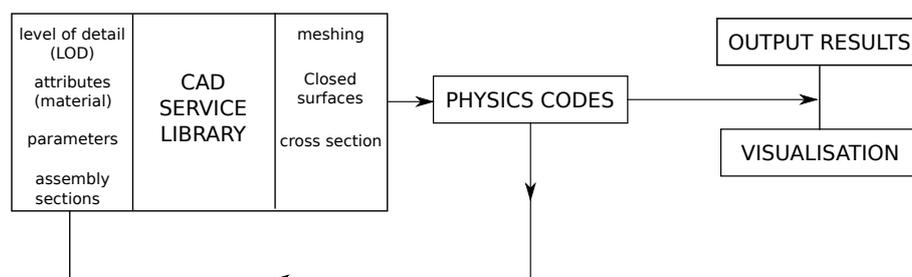


Figure 1: A CAD service library in a typical physics code workflow provides “controllable” input that can vary in levels of details and other code input aspects in a geometry loop with discretisation as needed.

References

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*See <http://www.euro-fusionscipub.org/mst1>