

PREPARING NON-CONFORMING MESHES OF B-REP NURBS FOR DG-BEM SIMULATIONS

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ABSTRACT

Accommodating the flexibility of B-Rep NURBS with the strict meshing requirements of downstream applications such as numerical analysis involves numerous issues. Generating a valid volume mesh and trimming on NURBS, in particular, present severe challenges [1, 2].

The discontinuous Galerkin boundary element method (DG-BEM) allows for simulations on non-conforming surface meshes [3], alleviating the need for volumetric discretization. Furthermore, the non-conforming meshes reduce requirements on trimmed NURBS. Yet, non-conforming boundaries of the mesh must provide some connectivity information for the DG-BEM simulation. The algorithm developed in this work automatically determines where to join the NURBS patches and subsequently generates the connectivity information on associated meshes.

Several test examples, including models from our industrial partner GIPRO, demonstrate the performance of our approach. In addition, subsequent electrostatic simulation results are shown.

Keywords: computer aided geometric design, non-conforming mesh, trimmed geometries, DG-BEM

References

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