

Implementation of an Adaptive Mesh Refinement Scheme for Thin-Shell Finite-Element Analysis based on Loop Subdivision Surfaces

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The numerical simulation of N. Stoop for thin-shell finite-element analysis with Loop subdivision surfaces has been extended by an adaptive mesh refinement algorithm proposed by E. Grinspun, P. Krysl and P. Schröder, called CHARMS. Traditional refinement schemes refine elements in isolation. This could lead to discontinuities in the solution, which have to be treated by imposing constraints. The approach of CHARMS methods is to avoid such problems by refining basis functions instead of single elements. As a consequence, the refined mesh is always compatible and the algorithm is simpler and more robust. Our tests show that the refinement algorithm works, except for one test which unveils a bug in the implementation.

