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# A GEOMETRY PROJECTION METHOD FOR THE COMPUTATIONAL DESIGN OF SANDWICH STRUCTURES WITH TRUSS AND PRISMATIC CORES

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We present a topology optimization method for the design of sandwich structures with truss and prismatic cores. Prevalent density-based and level-set topology optimization techniques render organic designs that are highly efficient but that often cannot be manufactured with available and scalable fabrication techniques. In the case of sandwich structures, common core configurations amenable to manufacturing include trusses made of cylindrical struts, and corrugated, folded or honeycomb cores with plate-like elements [1]. The geometry projection method [2] can directly produce these geometric configurations by smoothly mapping a parametric description of geometric components of fixed shape but variable size (such as cylinders and plates) onto a density field defined on a fixed grid. Recent work has successfully demonstrated the design of plate structures and the optimal layout of welded reinforcement ribs using geometry projection [3, 4]. These techniques are extended in this work to the design of sandwich structures.

We present several examples that demonstrate our method whereby we minimize the structural compliance of the panel subject to a volume constraint. To design the panel, we impose a periodic design, however we analyze and design an entire panel (thus, no homogenization is performed).

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