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Geometrical shape features extraction based on the partial differential equation inspired by the high order homogenization and its application to topology optimization

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Abstract

Topology optimization [1] is a powerful design tool to obtain a high-performance design solution. However, it is difficult to apply obtained solution in industrial products because an obtained solution includes geometrical complex shapes. In order to overcome the problem, geometrical constraint by the fictitious physical model [2] are proposed. The fictitious physical model represents geometrical constraint for casting by a partial differential equation (PDE). Although the method has high potential for design problem in casting parts, the PDE represents casting constraint only.

I present a novel method for extraction of key geometrical shape features based on the partial differential equation inspired by the high order homogenization. Additionally, the proposed method is applied to geometrical constraint in topology optimization.

References

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