SHAPE OPTIMIZATION OF PEDESTALS USING PROFILE MAP

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Abstract

Most of the shape optimization problems, reported in the literature, are solved by gradient based or gradientless methods. Gradientbased or sensitivity based methods of structural shape optimization are mathematically robust but computationally very expensive. Also the coding for sensitivity calculation is very tedious. In Gradientless methods, boundary stresses are directly used for shape modifications. These methods are simple and take less time but by simply adding and deleting materials sharp corners are created which in turn cause stress concentration. To overcome these difficulties of the conventional methods a simple and practical approach of 'Shape Profile Map' is proposed in this study. In this study shape optimization of pedestals are attempted using profile map. This map is generated using finite element analyses results, considering various geometrical parameters. One such map is validated with finite element analyses results on new problems. It is observed that profile map provides an efficient approach for shape optimization of structures without going into mathematical complexity.

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