Application of the Discrete Adjoint Method to Practical Components

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In order to design products which satisfy various demands within a limited period, shape optimization technology utilizing CAE attracts much attention. However, conventional shape optimization technology with parametric shape modification has two problems as follows: (1) an expensive computational cost to obtain the final shape, (2) the performance of final shape depends on the skill or the experience of designer.

We employed a discrete adjoint method in order to resolve those problems and consider versatility for application in various product design. Our shape optimization technology has been developed as a post-processing program to be able to import the results by various commercial CFD software and deal with arbitrary objective functions. We show some cases of the application of our program to practical component.