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SHAPE OPTIMIZATION AND INVERSE PROBLEMS IN HEAT TRANSFER EMPLOYING AN IGA-BEM APPROACH

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This work focuses on the 2-D steady-state heat conduction problem across the periodic interface separating two conducting and conforming material strips of infinite length. Our solver combines the Boundary Element Method (BEM) with the Iso-Geometric Analysis (IGA) concept and exhibits, as it will be demonstrated, superior convergence characteristics compared to classical panel methods.

In this presentation, emphasis will be placed on the application of the developed IGABEM solver in shape optimization of these separating interfaces, under various geometric constraints, with the aim of heat transfer maximization. Additionally, handling of inverse problems, where we seek the interface shape achieving a given heat transfer value, will be also discussed, and presented.