Investigation of blending-function-based overlapping-grid technique for compressible flows

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Abstract: The paper presents the development and investigation of a blending-function based overlapping-grid technique for compressible Euler flows. In this technique local solutions, obtained on overlapping subdomains, are combined into a global function using blending functions as weights. This global function is subsequently used to impose new boundary conditions on interfaces The local solutions are obtained using the Riemann solver and an implicit-unfactored method, for spatial and temporal discretization, respectively. Several numerical experiments are carried out for flows around circular-arc and two-element airfoils, and demonstrate that the blending function approach improves the numerical convergence for grid configurations containing multiple overlaps.