

# QUADRATURE-FREE DISCONTINUOUS GALERKIN METHOD FOR SHALLOW WATER EQUATIONS ON BLOCK-STRUCTURED GRIDS

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Computational domains relevant for real-life ocean applications often have complex geometry and are thus best suited for unstructured-mesh discretizations. However, structured grids offer better computational efficiency on cache-based CPUs and GPUs due to their predictable memory access patterns. To combine the geometrical flexibility of unstructured meshes with performance of structured grids we develop a block-structured grid methodology that includes a first of its kind block-structured grid generator for realistic ocean domains [1], a new quadrature-free discontinuous Galerkin discretization scheme for the shallow water equations [2] derived from the UTBEST model [3], and the capability to run on CPUs and GPUs based on the code generation framework ExaStencils [4].

## REFERENCES

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