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A Julia implementation of the Domain Decomposition Method (DDM.jl)

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We present a recently developed Julia implementation of the Domain Decomposition Method (DDM). DDM is a powerful framework for formulating preconditioning techniques. The objectives of our package are twofold: (1) to implement DDM primitives for easy prototyping of new preconditioning strategies and (2) to leverage them to solve the linear systems that arise from Computational Fluid Dynamics applications. We will highlight the key differences between our implementation and state-of-the-art DDM implementations like FreeFEM and PETSc, as well as share the lessons we have learned along the way. The initial release of our package includes classical one-level and two-level preconditioners, and future developments will incorporate advanced preconditioners such as GenEO and multi-level techniques.

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