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Structured-grid Multigrid for Taylor-Hood finite elements

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Recent years have seen renewed interest in the numerical solution of the Stokes Equations. While many preconditioning approaches ignore the underlying mesh geometry, our approach is to develop a structured-grid implementation, taking advantage of the highly structured data-access patterns and employing stencil-based calculations. This opens up many opportunities for fine-grained parallelism, allowing us to take advantage of multicore and accelerated architectures. In this talk, we discuss progress to date in (parallel) implementation and optimisation of a structured-grid monolithic Multigrid approach for Q2-Q1 finite-element discretisations on structured meshes.