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Preconditioners for solving Navier-Stokes equations with random input data.

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Over the last decade, there has been a substantial amount of research activity on solving elliptic PDEs with random data. Linear algebra techniques for solving such problems are now relatively mature. In contrast, much less work has been done on solving saddle point problems with random data, both in terms of approximation theory and developing efficient linear algebra techniques.

We present some preliminary work on solving steady-state Navier Stokes equations with random data (viscosity, boundary conditions etc). The focus of the talk will be on preconditioning techniques for stochastic Galerkin discretisations, which make use of existing deterministic solvers such as the so-called least-squares commutator approximation and the pressure convection-diffusion approximation.