

# Non-linear Stokes solve (-snes\_XXX)

Guidance:

<linear problems> -snes\_type ksonly

<non-linear problems> -snes\_type ls

## Stokes solve (-ksp\_XXX)

Guidance:

-ksp\_type fgmres

-ksp\_rtol 1.0e-2

-ksp\_max\_it 60

-pc\_type fieldsplit

Notes:

## Viscous block solve (-fieldsplit\_u\_ksp\_XXX)

Guidance:

-fieldsplit\_u\_ksp\_type cg

-fieldsplit\_u\_ksp\_max\_it 1

-fieldsplit\_u\_pc\_type mg

-fieldsplit\_u\_mg\_levels\_ksp\_type chebyshev

-fieldsplit\_u\_mg\_levels\_ksp\_max\_it 10

-fieldsplit\_u\_mg\_levels\_pc\_type jacobi

Notes:

Nesting Krylov solves inside the viscous block can lead to unstable residuals when comparing serial and parallel.

## Pressure Schur complement solve (-fieldsplit\_p\_ksp\_XXX)

Guidance:

-fieldsplit\_p\_ksp\_type preonly

-fieldsplit\_p\_pc\_type jacobi

Notes:

Little to no benefit comes from doing aggressive solves on the scaled mass matrix approximation to the Schur complement