II. Solver MG vs CG vs RB

Solver Performance using Multigrid vs CG et al

See for CG https://authors.library.caltech.edu/records/e7fwb-j3238

https://en.wikipedia.org/wiki/Conjugate_gradient_method

https://en.wikipedia.org/wiki/Multigrid_method

A Linear Algebra Problem

- Ax = b
- Sparse matrix

- Very small eigenvalues (~0.0001)
  - Jacobi, Gauss-Seidel take too long
  - Conjugate gradient also takes too long
- Multigrid is a solution

What is a Multigrid?

- It is a recursive divide and conquer method used in many fast algorithms for computer science tasks and numerical methods for high performance computing.

- The main idea of multigrid is to accelerate the convergence of a basic iterative method (known as relaxation) by a *global* correction of the fine grid solution approximation from time to time, accomplished by solving a coarse problem.