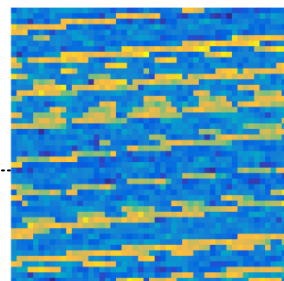


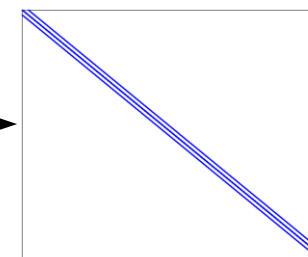
Discretization

Solution

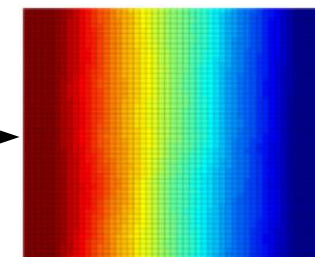
Detailed
Fine-scale Data

Fine-scale Solution Framework

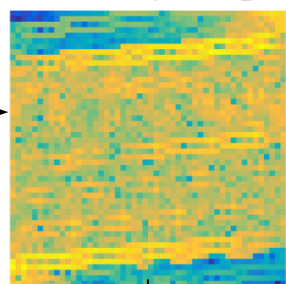
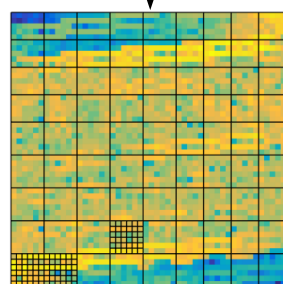
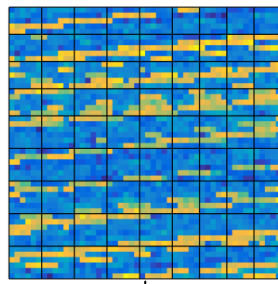
$$Ap = q$$



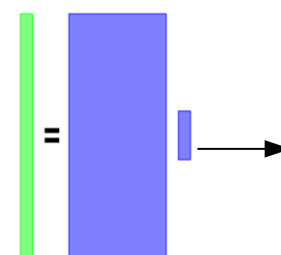
Fine-scale



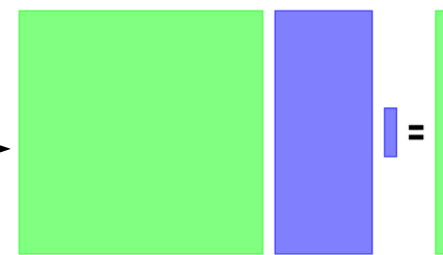
Multiscale Solution Framework

Single-phase
Vorticity MapUniform
CoarseningVorticity-based
Refinement

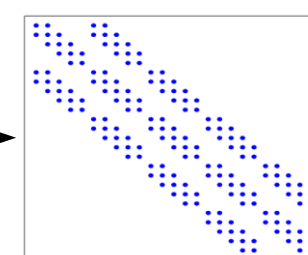
$$p = Pp_c$$



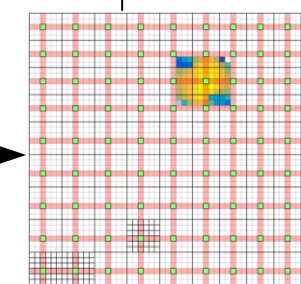
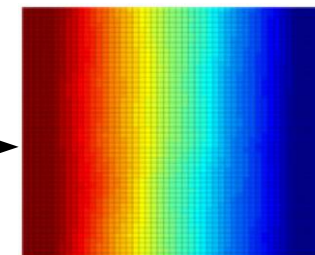
$$APp_c = q$$



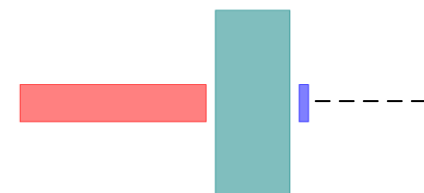
$$A_cp_c = q_c$$



Multiscale

Support Regions
and
Basis Functions

$$R(AP)p_c$$



Vorticity Preservation Theory