Algebraic Multigrid Algorithms

Given Matrix $A \in \mathbb{R}^{n \times n}$ SPD

Wanted Iterative method B to precondition the CG method:

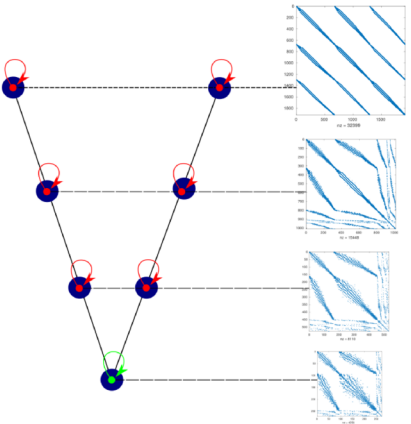
- Hierarchy of systems

$$A_l \mathbf{x}_= \mathbf{b}_l, l = 0, \ldots, \text{nlev}$$

- Transfer operators:

$$P_{l+1}^l : \mathbb{R}^{n_{l+1}} \to \mathbb{R}^{n_l}$$

Missing Structural/geometric infos



Smoother

$M_l : \mathbb{R}^{n_l} \to \mathbb{R}^{n_l}$: "High frequencies"

Prolongator

$P_{l+1}^l : \mathbb{R}^{n_l} \to \mathbb{R}^{n_{l+1}}$: "Low frequencies"

Complementarity of Smoother and Prolongator