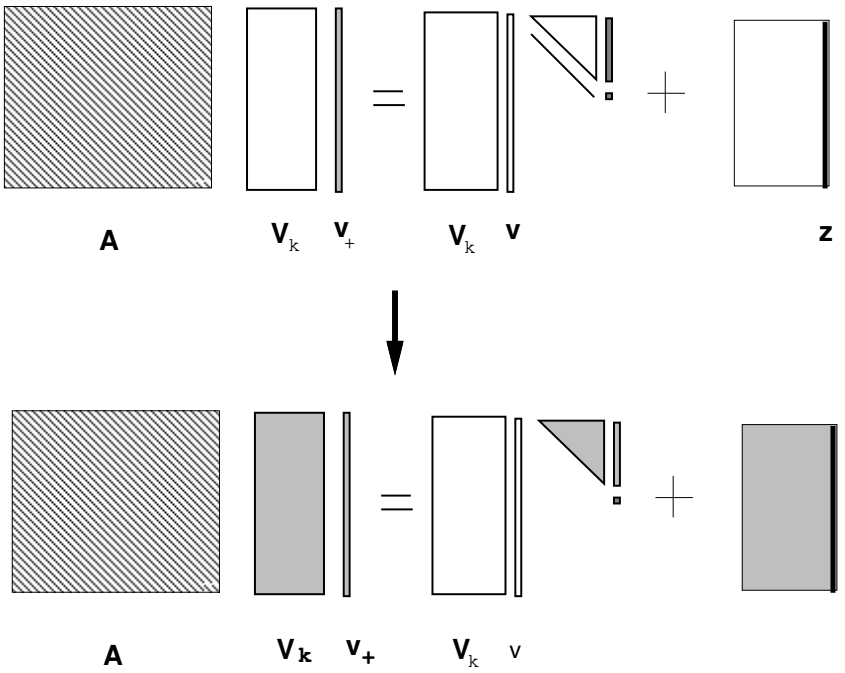
Inexact TRQ iteration



$$(A - \mu I)\tilde{v}_1^+ = \rho_{1,1} v_1 + z\delta$$

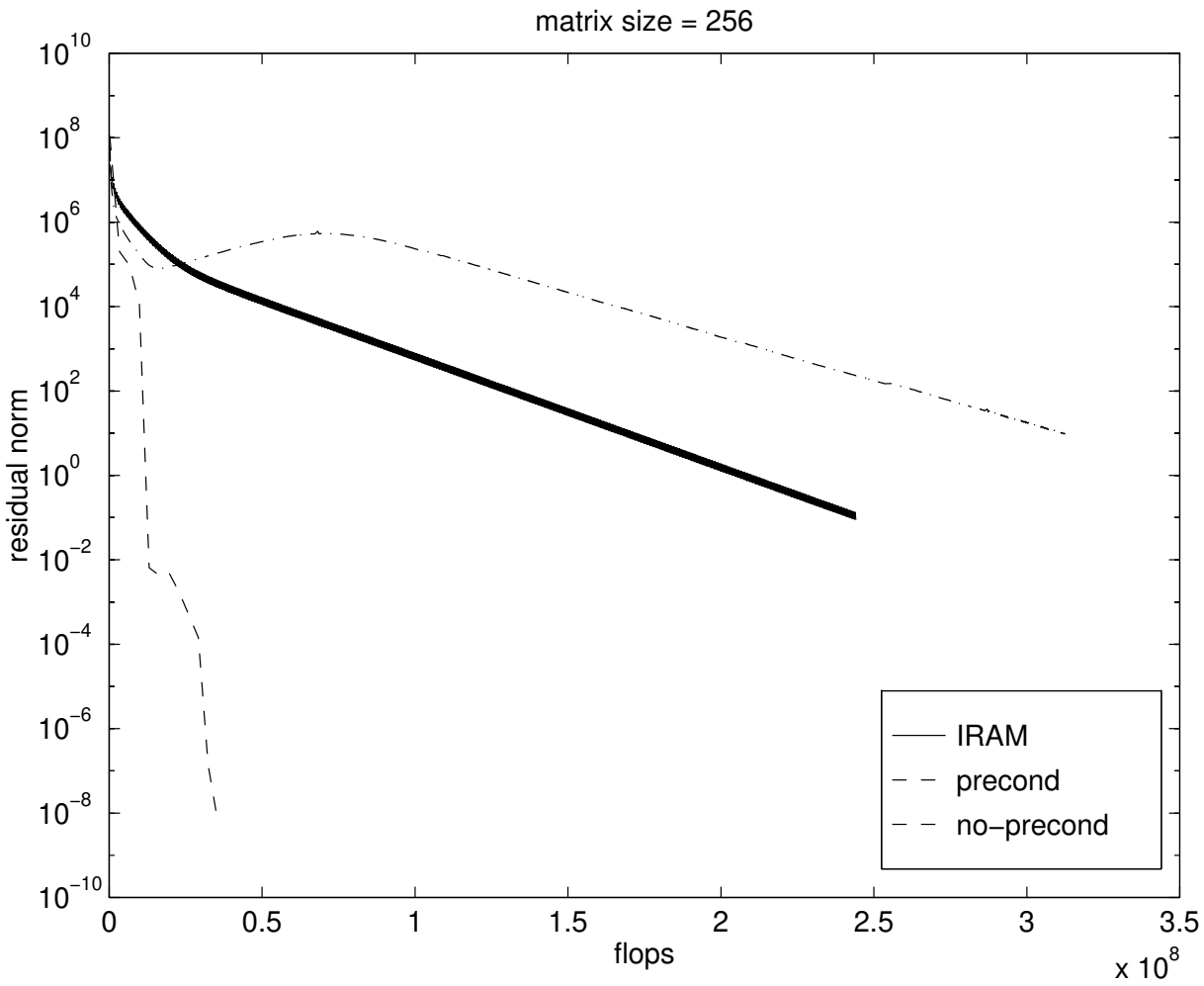
where δ is a product of $k-1$ sines (error damping).

Preconditioning

- Precondition $A - \mu I$ directly

$$w \leftarrow (I - V_k V_k^H)(A - \mu I)^{-1} v;$$

- Precondition $\hat{A} = (I - V_k V_k^H)(A - \mu I)(I - V_k V_k^H)$
  If K^{-1} *approximates* $A - \mu I$ *well,*
  $(I - V_k V_k^H) K^{-1} (I - V_k V_k^H)$ *should approximate* $\hat{A}$ *well.*


matrix size = 256
residual norm
flops
x 10^8
IRAM
precond
no−precond

Conclusion

- A variant of Krylov method related to RQ-iteration
- fast convergence if A can be factored
- allows preconditioned iterative solver
- needs further research on preconditioning
- extend to generalized eigenvalue problem?