1 Test matrices

Matrix	Patt. symm.	Num. symm.	Diag. dom.	Pos. def.	NNZ	n	Condition
add20	100%	52.7%	No	No	13,151	2,395	1.204710e+04
c-20	100%	100%	No	No	20,445	2,921	1.049837e+12
cryg2500	99.5%	0%	No	No	12,349	2,500	3.631392e+16
dw2048	98.5%	94.8%	No	No	10,114	2,048	2.093210e+03
orsreg_1	100%	41.2%	**Yes**	No	14,133	2,204	6.745269e+03
pde2961	100%	50.1%	No	No	14,585	2,961	6.424933e+02
wang1	100%	80.8%	No	No	19,093	2,903	2.032301e+04
ex28[1]	100%	98.8%	No	No	77,031	2,603	1.983028e+05
S40PI[2]	100%	2.3%	No	No	5,341	2,182	3.851536e+18

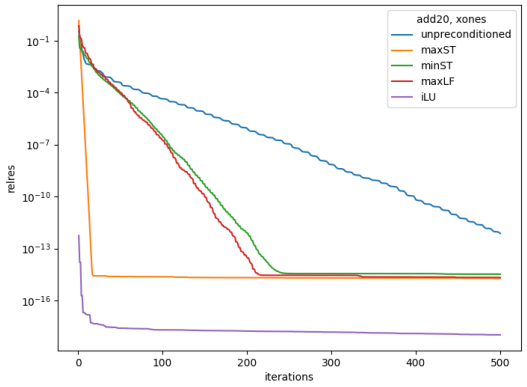
2 S coverage, degree[3]

Matrix	maxST	minST	maxLF
add20	0.9997	0.6480	0.9496
c-20	0.9998	0.9996	0.9996
cryg2500	0.9064	0.5744	0.9040
dw2048	0.9437	0.6371	0.9423
orsreg_1	0.9954	0.5017	0.9949
pde2961	0.8742	0.6370	0.8730
wang1	0.8905	0.5316	0.8795
ex28	0.6588	0.3239	0.6349
S40PI	0.0703	0.0703	0.0703

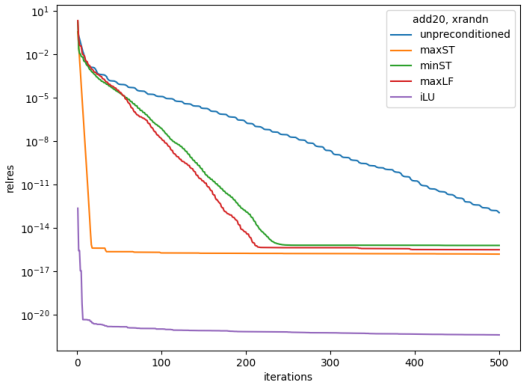
Matrix	maxST	minST	maxLF
add20	11	27	2
c-20	148	40	2
cryg2500	3	4	2
dw2048	5	4	2
orsreg_1	3	4	2
pde2961	3	3	2
wang1	5	6	2
ex28	5	7	2
S40PI	2	2	2

3 Results

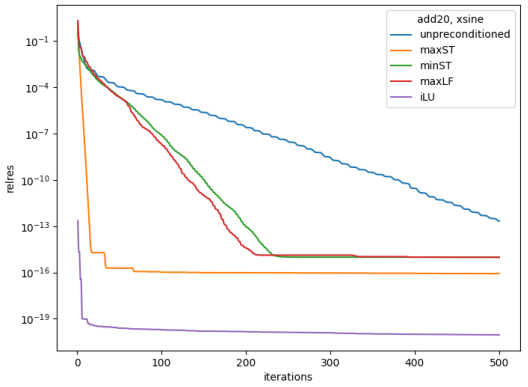
[1] Preconditioners are singular, except for iLU(0).
[2] Preconditioners are singular.
[3] S degree $:= \max_{i \in [n]} |\{j \mid A_{ij} \neq 0\}| - 1$



(a) $x = 1$

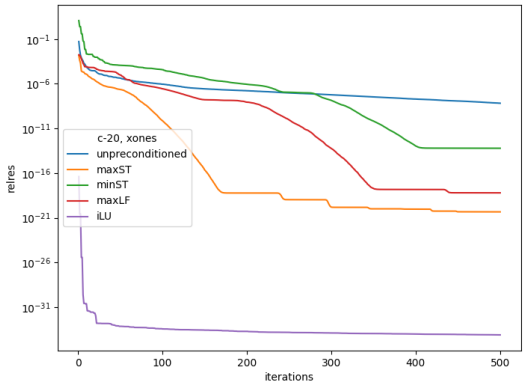


(b) $x \sim \mathcal{N}(0, 1)$

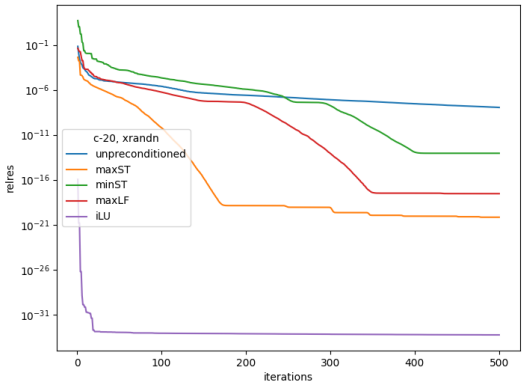


(c) $x = \sin([0, 100\pi])$

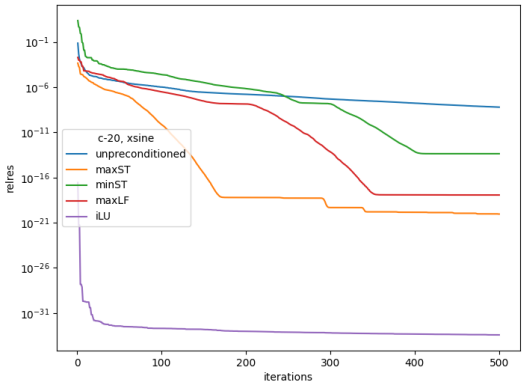
Figure 1: add20



(a) $x = 1$

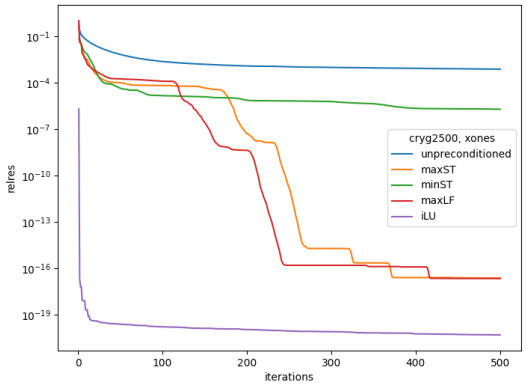


(b) $x \sim \mathcal{N}(0, 1)$

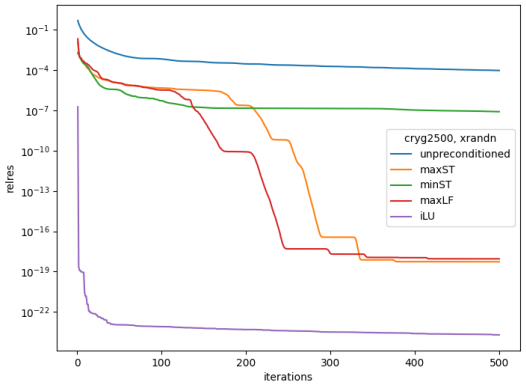


(c) $x = \sin([0, 100\pi])$

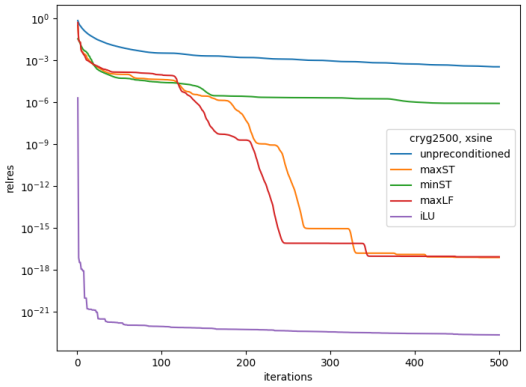
Figure 2: c-20



(a) $x = 1$

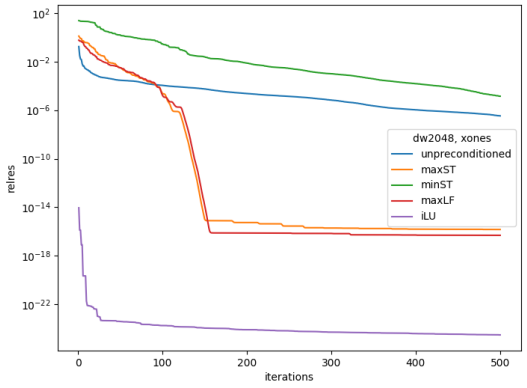


(b) $x \sim \mathcal{N}(0, 1)$

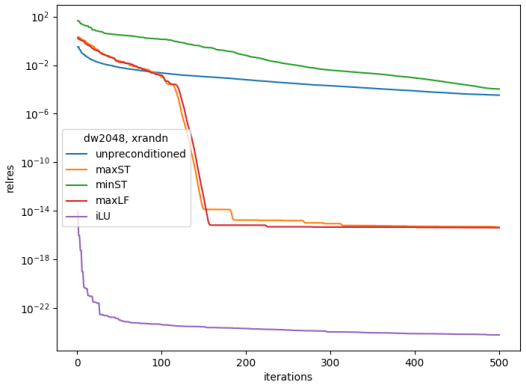


(c) $x = \sin([0, 100\pi])$

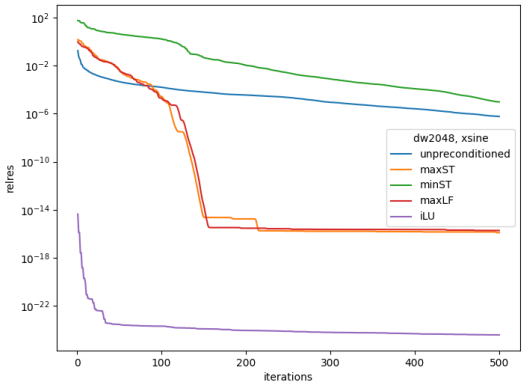
Figure 3: cryg2500



(a) $x = 1$

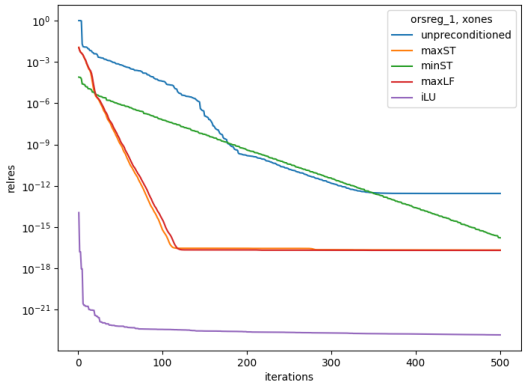


(b) $x \sim \mathcal{N}(0, 1)$

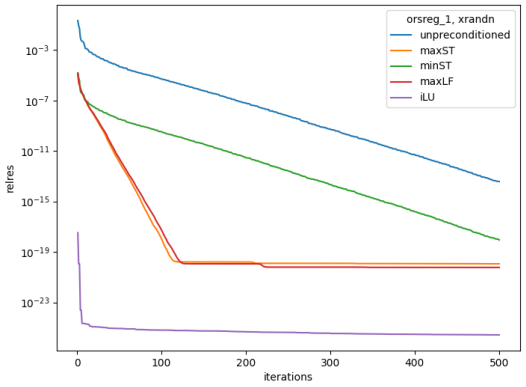


(c) $x = \sin([0, 100\pi])$

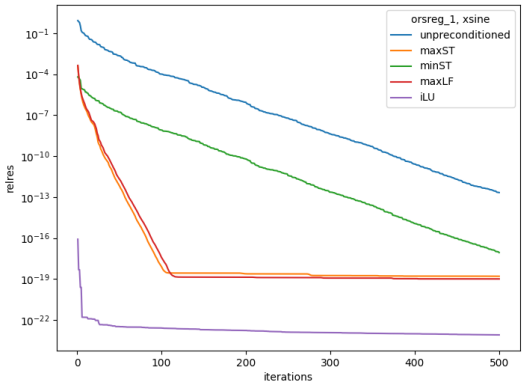
Figure 4: dw2048



(a) $x = 1$

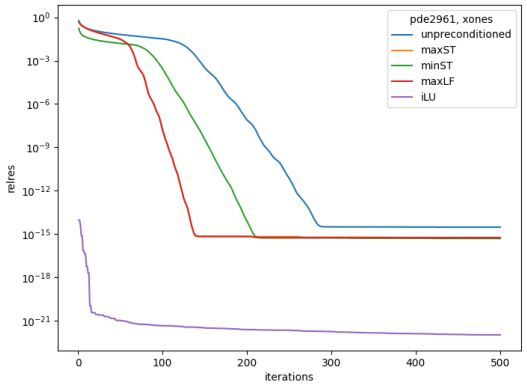


(b) $x \sim \mathcal{N}(0, 1)$

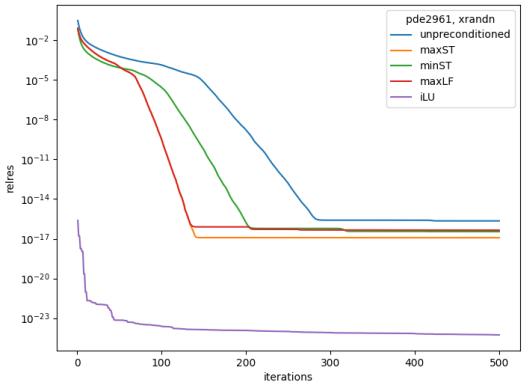


(c) $x = \sin([0, 100\pi])$

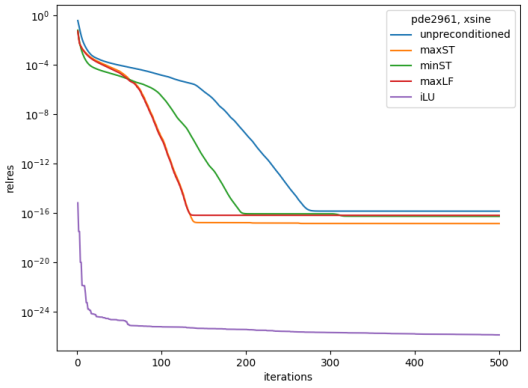
Figure 5: orsreg_1



(a) $x = 1$

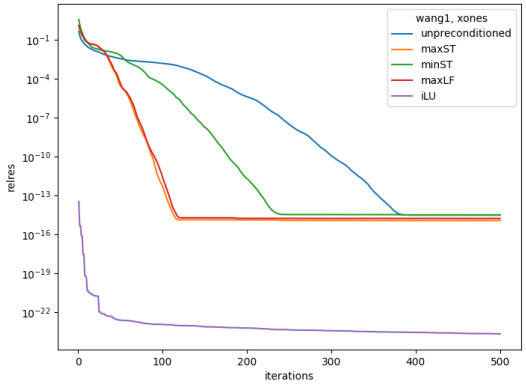


(b) $x \sim \mathcal{N}(0, 1)$

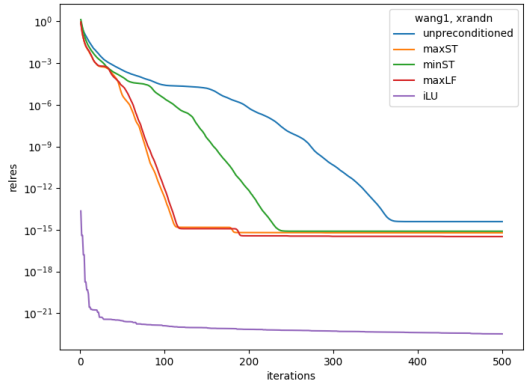


(c) $x = \sin([0, 100\pi])$

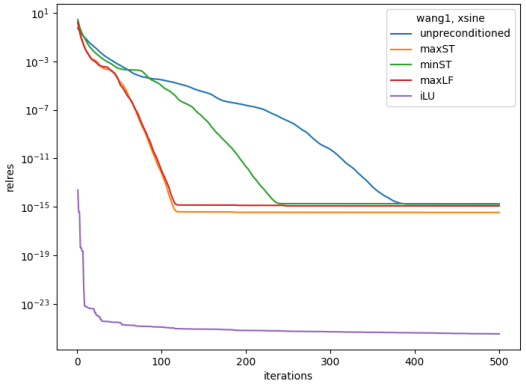
Figure 6: pde2961



(a) $x = 1$



(b) $x \sim \mathcal{N}(0, 1)$



(c) $x = \sin([0, 100\pi])$

Figure 7: wang1