

1 Test matrices

Matrix	Patt. symm.	Num. symm.	Diag. dom.	Pos. def.	NNZ	n	Condition
<i>add20</i>	100%	52.7%	No	No	13,151	2,395	1.204710e+04
<i>c-20</i>	100%	100%	No	No	20,445	2,921	1.049837e+12
<i>cryg2500</i>	99.5%	0%	No	No	12,349	2,500	3.631392e+16
<i>dw2048</i>	98.5%	94.8%	No	No	10,114	2,048	2.093210e+03
<i>orsreg_1</i>	100%	41.2%	Yes	No	14,133	2,204	6.745269e+03
<i>pde2961</i>	100%	50.1%	No	No	14,585	2,961	6.424933e+02
<i>wang1</i>	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
gre512 ²	0%	0%	No	No	1,976	512	1.58318e+02
S40PI ³	100%	2.3%	No	No	5,341	2,182	3.851536e+18

2 S coverage, degree⁴

Matrix	jacobi	tridiag	maxLF	maxST	minST
<i>add20</i>	0.5686	0.5698	0.9496	0.9997	0.6480
<i>c-20</i>	0.9994	0.9994	0.9996	0.9998	0.9996
<i>cryg2500</i>	0.5038	0.8796	0.9040	0.9064	0.5744
<i>dw2048</i>	0.5808	0.9140	0.9423	0.9437	0.6371
<i>orsreg_1</i>	0.5001	0.5003	0.9949	0.9954	0.5017
<i>pde2961</i>	0.5027	0.6310	0.8730	0.8742	0.6370
<i>wang1</i>	0.5008	0.7422	0.8795	0.8905	0.5316
ex28	0.3236	0.3311	0.6349	0.6588	0.3239
gre512	0.1797	0.1816	0.4165	0.4292	0.4292
S40PI	0.0486	0.9231	0.0703	0.0703	0.0703

Matrix	orig	jacobi	tridiag	maxLF	maxST	minST
<i>add20</i>	83	0	2	2	11	27
<i>c-20</i>	157				148	40
<i>cryg2500</i>	4				3	4
<i>dw2048</i>	7				5	4
<i>orsreg_1</i>	6				3	4
<i>pde2961</i>	4				3	3
<i>wang1</i>	6				5	6
ex28	61				5	7
gre512	4				2	2
S40PI	6				2	2

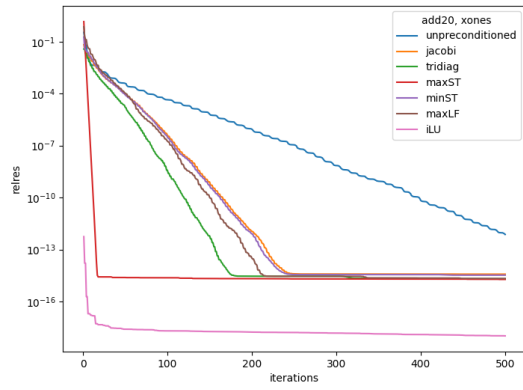
3 Results

¹Preconditioners are singular, except for iLU(0).

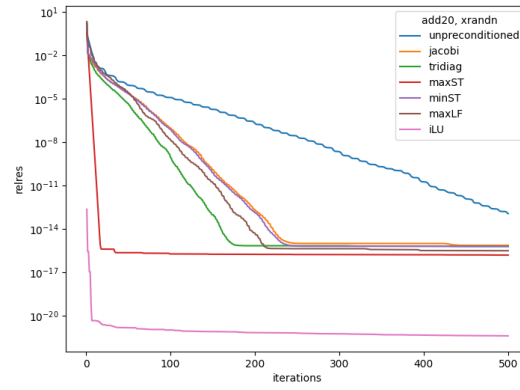
²Preconditioners are singular, except for iLU(0).

³Preconditioners are singular.

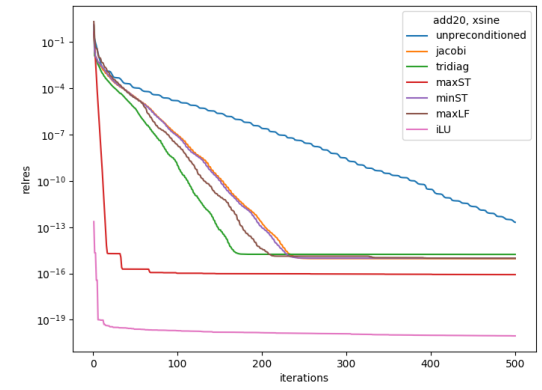
⁴ S degree := $\max_{i \in [n]} |\{j \mid A_{ij} \neq 0\}| - 1$



(a) $x = 1$

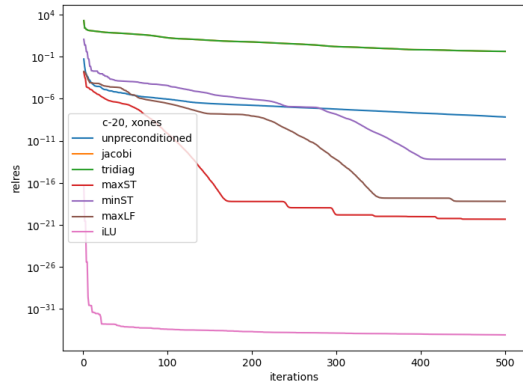


(b) $x \sim \mathcal{N}(0, 1)$

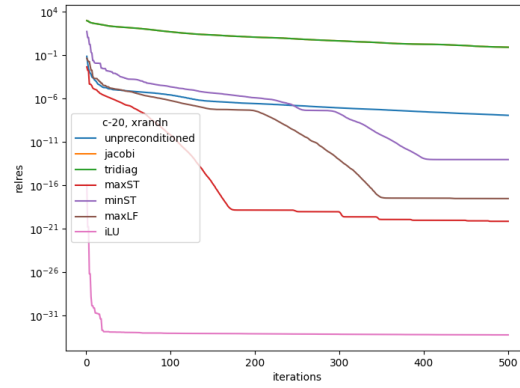


(c) $x = \sin([0, 100\pi])$

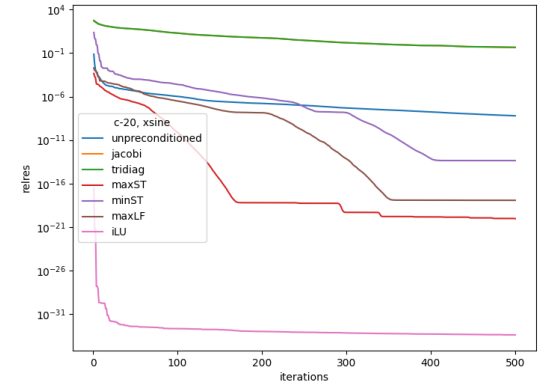
Figure 1: add20



(a) $x = 1$

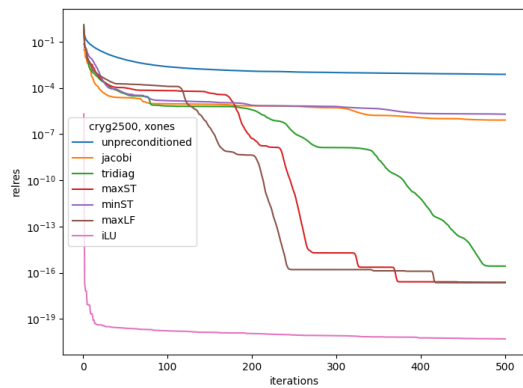


(b) $x \sim \mathcal{N}(0, 1)$

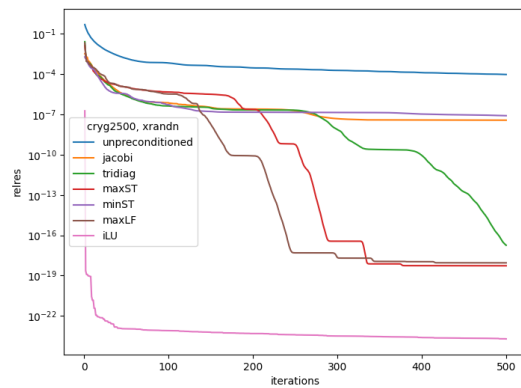


(c) $x = \sin([0, 100\pi])$

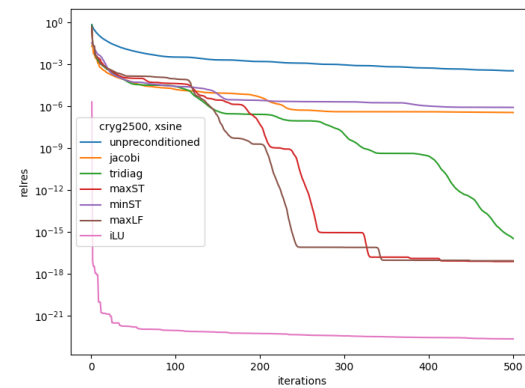
Figure 2: c-20



(a) $x = 1$

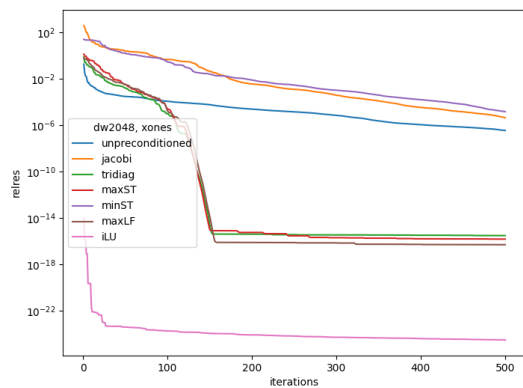


(b) $x \sim \mathcal{N}(0, 1)$

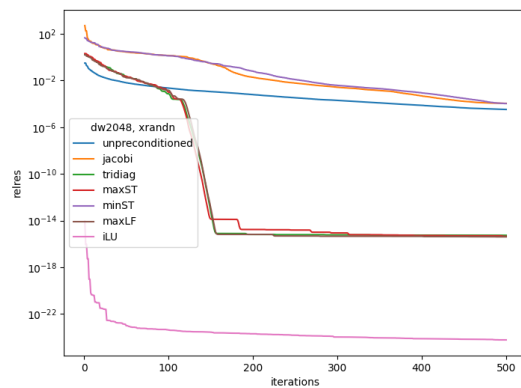


(c) $x = \sin([0, 100\pi])$

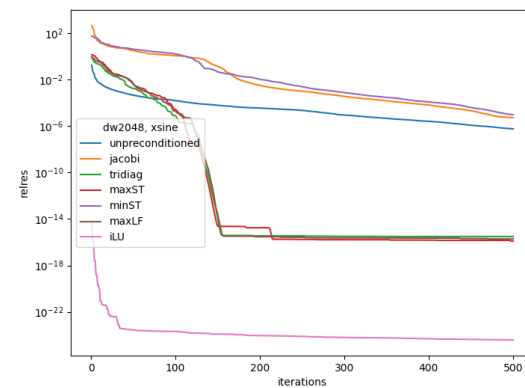
Figure 3: cryg2500



(a) $x = 1$

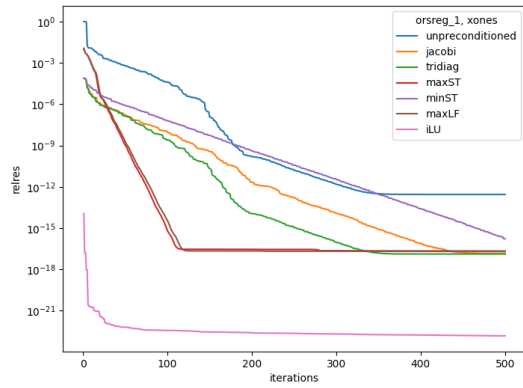


(b) $x \sim \mathcal{N}(0, 1)$

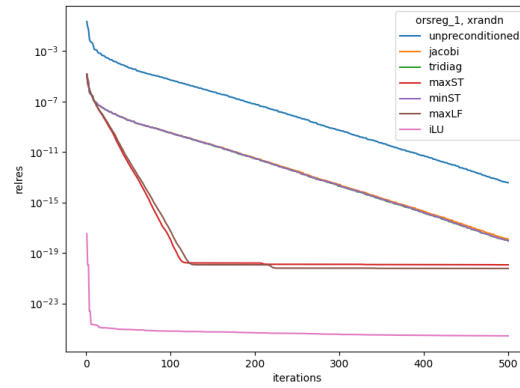


(c) $x = \sin([0, 100\pi])$

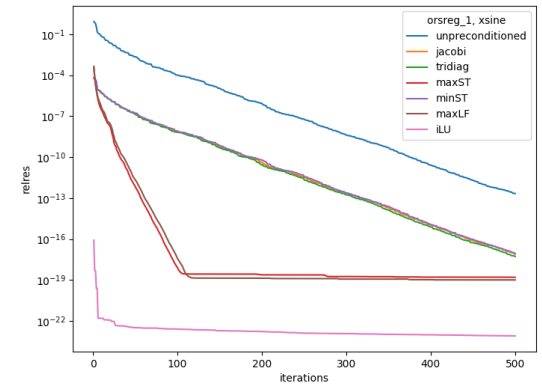
Figure 4: dw2048



(a) $x = 1$

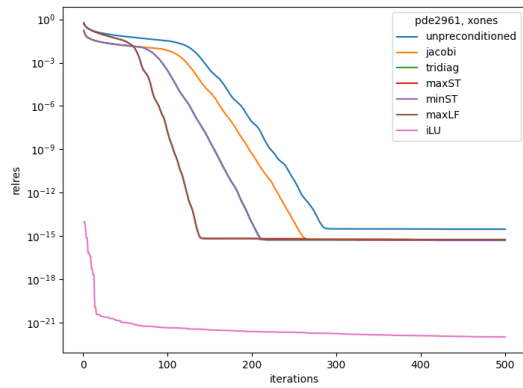


(b) $x \sim \mathcal{N}(0, 1)$

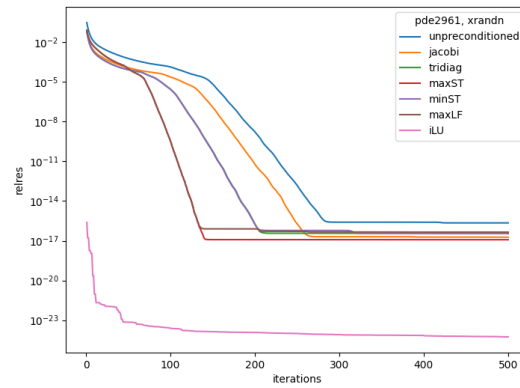


(c) $x = \sin([0, 100\pi])$

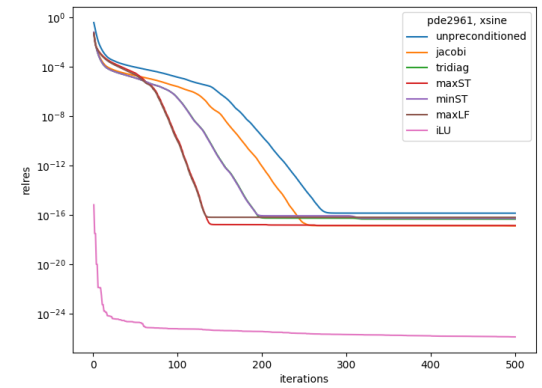
Figure 5: orsreg_1



(a) $x = 1$

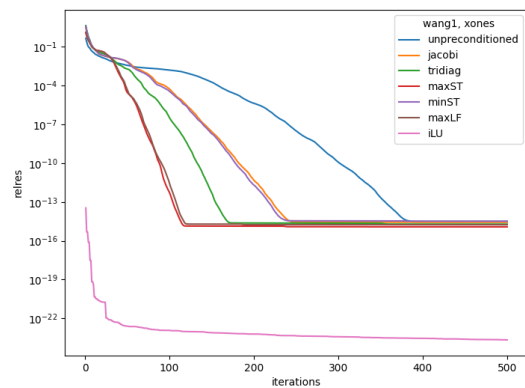


(b) $x \sim \mathcal{N}(0, 1)$

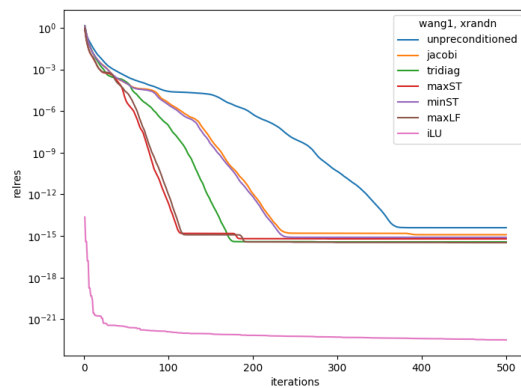


(c) $x = \sin([0, 100\pi])$

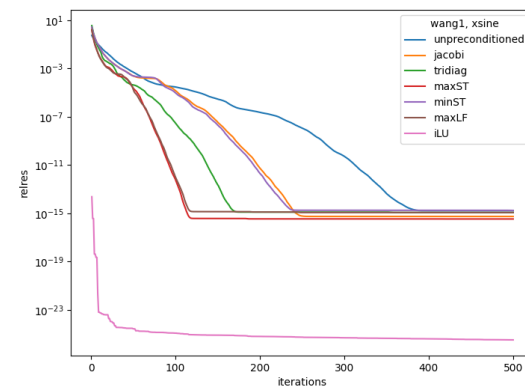
Figure 6: pde2961



(a) $x = 1$



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



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

Figure 7: wang1