



5G NR base matrices

- Two base matrices

- BG1: 46 x 68 and BG2: 42 x 52

- Block structure of base matrices

$$\begin{bmatrix} A & E & O \\ B & C & I \end{bmatrix}$$

- BG 1

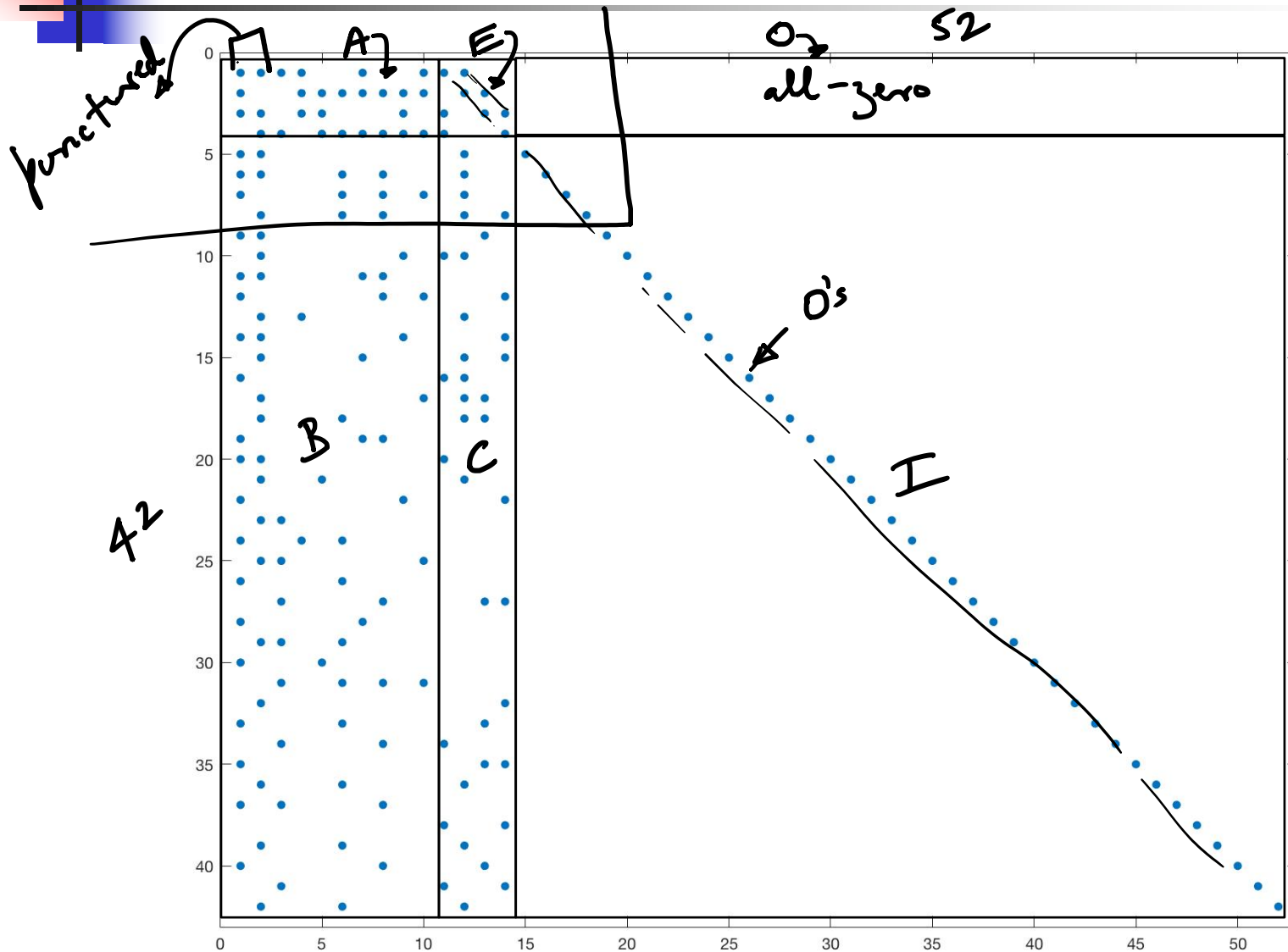
- A: 4 x 22, E: 4 x 4, O: 4 x 42 all ^{all -1's} zero
 - B: 42 x 22, C: 42 x 4, I: 42 x 42 identity

- BG 2

- A: 4 x 10, E: 4 x 4, O: 4 x 38 all zero
 - B: 38 x 10, C: 38 x 4, I: 38 x 38 identity

Example: BG2

-1 : ignored
0, 1, ... : dot (blue)





Expansion factor: Z_c

- Index and expansion factors

- iLS: 0, 1, 2, 3, 4, 5, 6, 7 ←
- a: 2, 3, 5, 7, 9, 11, 13, 15
- J_a : 7, 7, 6, 5, 5, 5, 4, 4
- Z_c : $a \times 2^j$, $j = 0, 1, 2, \dots, J_a$
 - Max $Z_c = \underline{\underline{384}}$

$j=0$ $j=1$
↓ ↓
 $a=2: 2, 4, 8, 16, 32, 64,$
 $128, 256$
↑
 $j=7$

- For each Z_c , base matrix entries specified

- $-1, 0, 1, \dots, Z_c-1$
- -1: $Z_c \times Z_c$ all-zero matrix
- i in $[0, Z_c-1]$: identity shifted right i times

Example: Base matrix entries

- 10 rows and 20 columns of BG2

\blacksquare $\underline{iLS = 3}, \underline{j = 4}, \underline{Zc = 48}$
 $a=3$

42 x 52.

6 E ← useful in encoding

24	14	23	37	-1	-1	47	-1	-1	8	1	0	-1	-1	-1	-1	-1	-1	-1	-1
5	-1	-1	12	19	12	19	8	29	31	-1	0	0	-1	-1	-1	-1	-1	-1	-1
8	35	-1	46	47	-1	-1	-1	43	-1	0	-1	0	0	-1	-1	-1	-1	-1	-1
-1	41	6	-1	36	28	28	14	12	37	1	-1	-1	0	-1	-1	-1	-1	-1	-1
8	16	-1	-1	-1	-1	-1	-1	-1	-1	-1	5	-1	-1	-1	0	-1	-1	-1	-1
41	42	-1	-1	-1	26	-1	27	-1	-1	-1	1	-1	-1	-1	-1	0	-1	-1	-1
27	-1	-1	-1	-1	7	-1	31	-1	30	-1	17	-1	-1	-1	-1	-1	0	-1	-1
-1	7	-1	-1	-1	13	-1	9	-1	-1	-1	6	-1	37	-1	-1	-1	0	-1	-1
3	43	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	8	-1	-1	-1	-1	0	-1	-1
-1	2	-1	-1	-1	-1	-1	-1	30	-1	40	35	-1	-1	-1	-1	-1	-1	-1	0