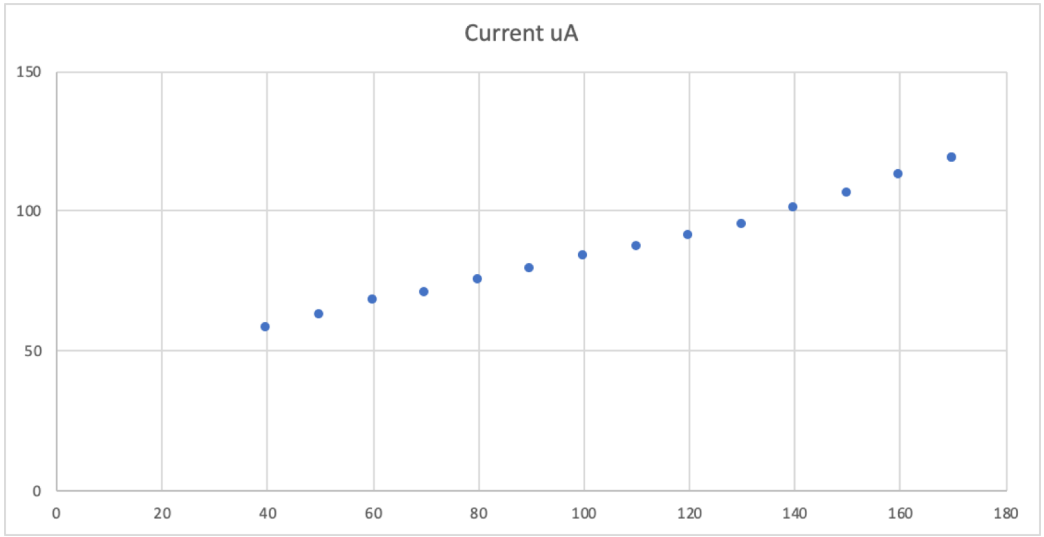
FBK 3D Sensor Half Moons
Batch Stepper_3 2021 RD53A:
IV and Irradiations at Ljubljana

Updated 4 July2021

MM, Firenze

Il Buono e il Cattivo

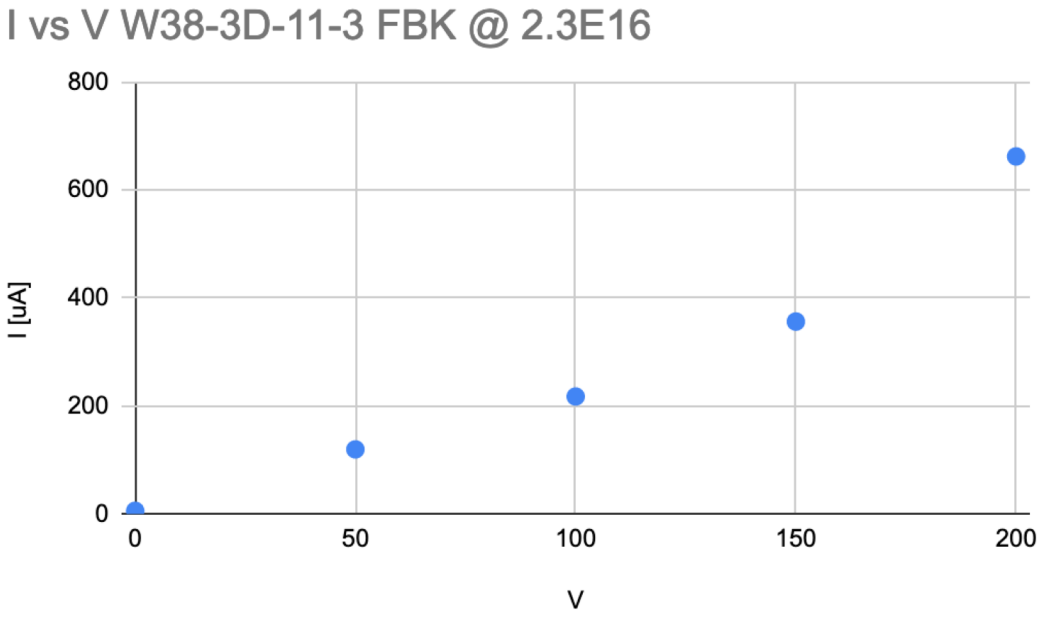
50x50 Mask Aligner 130um vs 25x100 Stepper_1 150um



Non sono direttamente confrontabili, ma certamente il 3D @ 2.3e16 neq tira troppa corrente.
A 200V deve dissipare 66mW/cm2: troppo!

W38-3D-11-3 150um @ 2.3E16 irr KIT uniforme

w3-x3y3-50x50 130um @1e16-CERN non uniforme



Ljubljana Irrad Channel

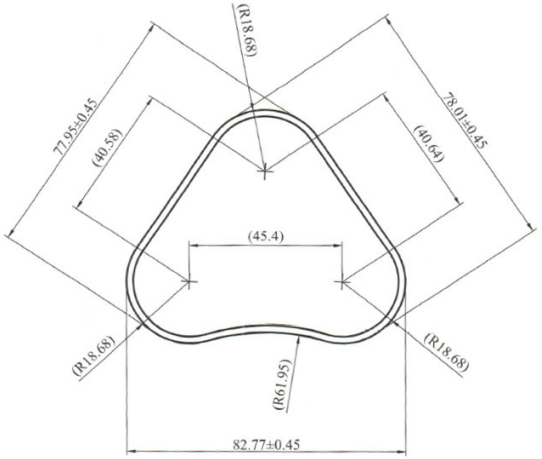
https://ric.ijs.si/en/triangular-channel/

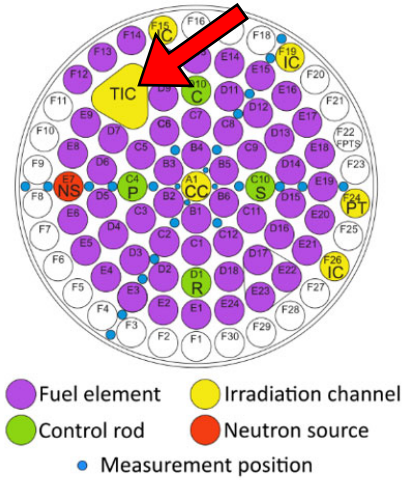
TRIANGULAR CHANNEL

	Neutron flux [$cm^{-2}s^{-1}$]
Thermal (< 0.625 eV)	4.5×10^{12}
Epithermal (0.625 – 10^5 eV)	3.5×10^{12}
Fast (> 10^5 eV)	3.8×10^{12}
Total	1.2×10^{13}
1 MeV equivalent	3.57×10^{12}

Features:

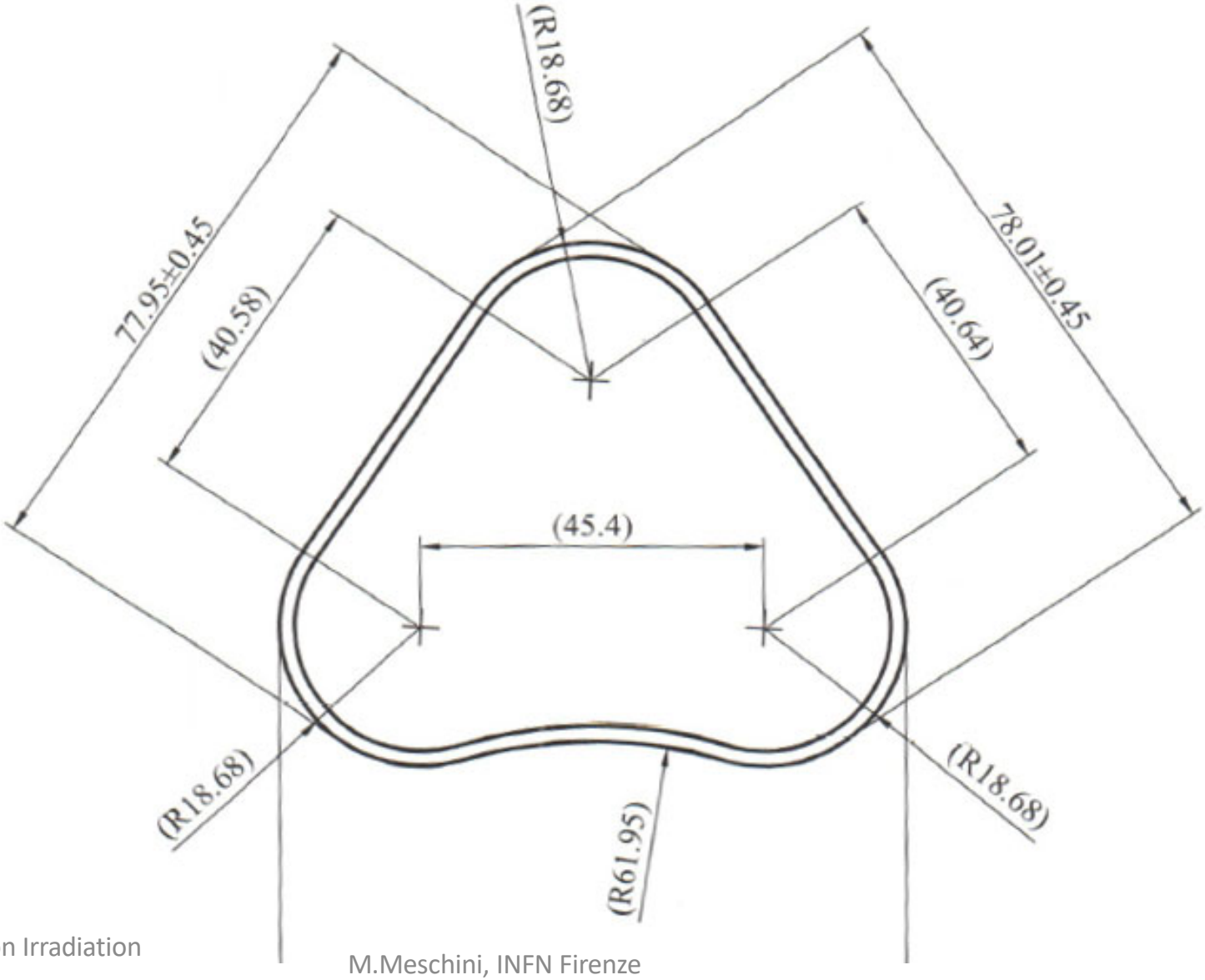
- Dry tube
- 5 cm in diameter, 20 cm high (see attached cross section)
- Possible on line irradiation





Channel Design

- Max useful size is 45 mm (has to include packaging and protections) but we can exploit the reduced thickness of the wafers

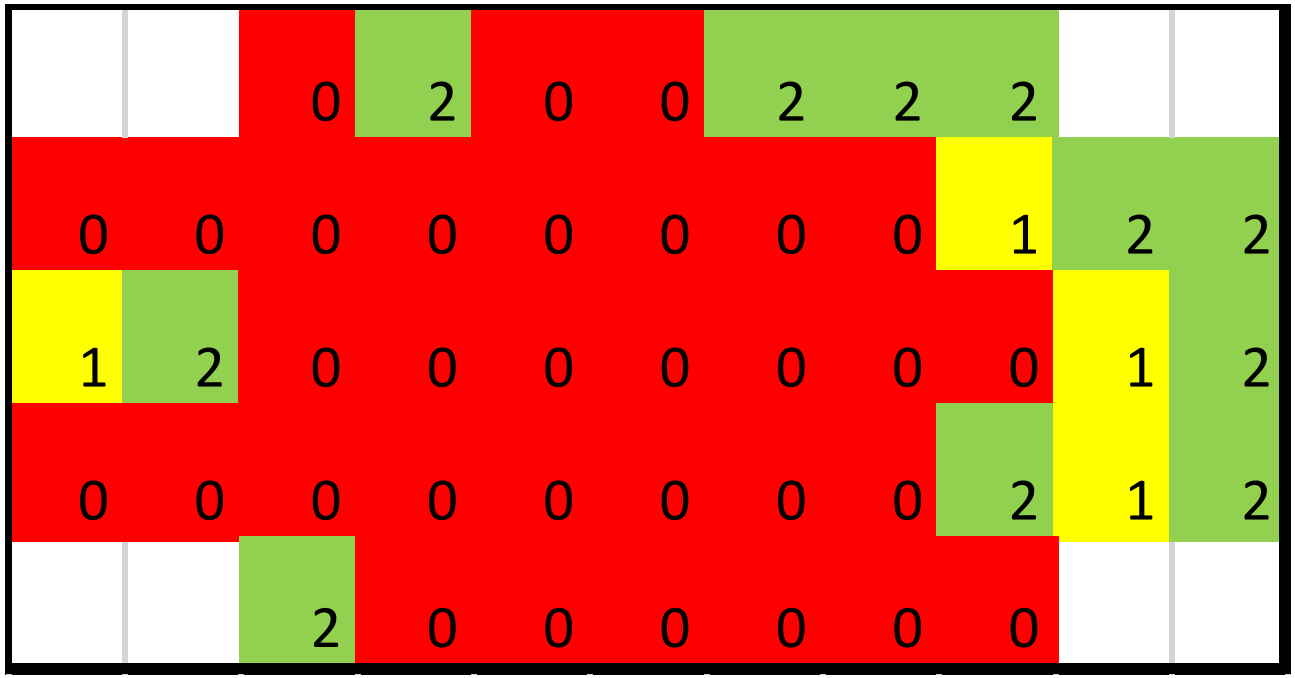


Back Side Metalization?

- Needed for good ohmic and thermal contact after irrad
- To be done on full wafer?
- Dicing only after metalization?
- How to do it?

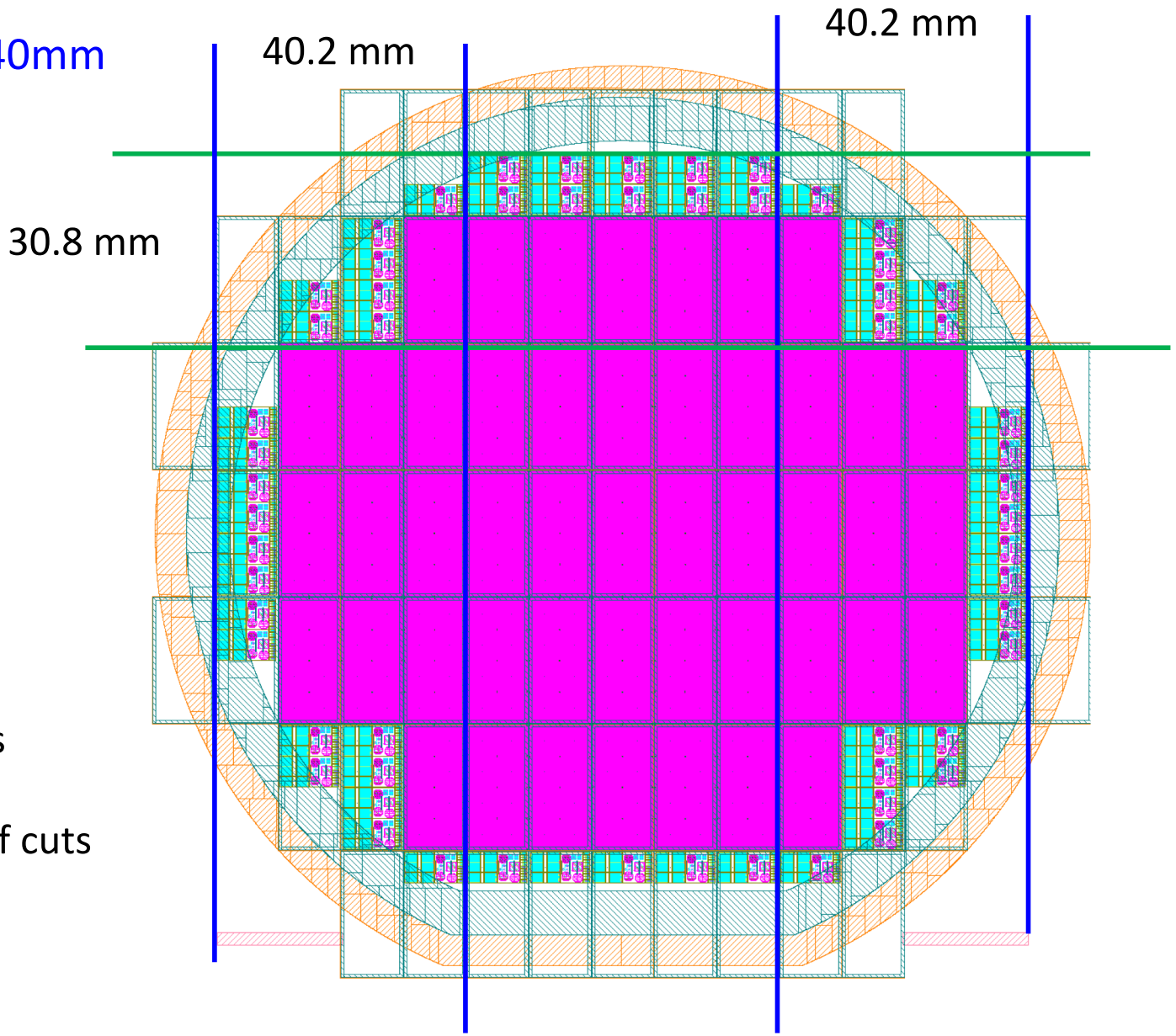
W31 Stepper_1

- 4 25x100 std
- 2 50x50
- Quesat e' la fetta misurata in dettaglio da Francesco, molti dati su sensori e TS



Dicing w31

- Max dimension ~40mm



Blue lines: first set of cuts

Green lines: second set of cuts

Reference for **Sensor Names Only**, not for Good Sensors

W36

W36		L_3,5	C_4,5	B_5,5	E_6,5	D_7,5	A_8,5	D_9,5		
E_1,4	D_2,4	C_3,4	B_4,4	A_5,4	L_6,4	B_7,4	C_8,4	A_9,4	D_10,4	E_11,4
L_1,3	B_2,3	E_3,3	C_4,3	D_5,3	A_6,3	E_7,3	B_8,3	C_9,3	A_10,3	D_11,3
A_1,2	B_2,2	C_3,2	D_4,2	E_5,2	A_6,2	D_7,2	C_8,2	L_9,2	B_10,2	D_11,2
		E_3,1	D_4,1	C_5,1	L_6,1	B_7,1	A_8,1	E_9,1		

Tipo	Verdi	Gialli
A=25x100 2E std	2	4
B=25x100 2E earO	1	0
C=25x100 2E earV	4	0
D=25x100 1E	5	1
E=50x50	5	3
L=50x50 BOC	3	0

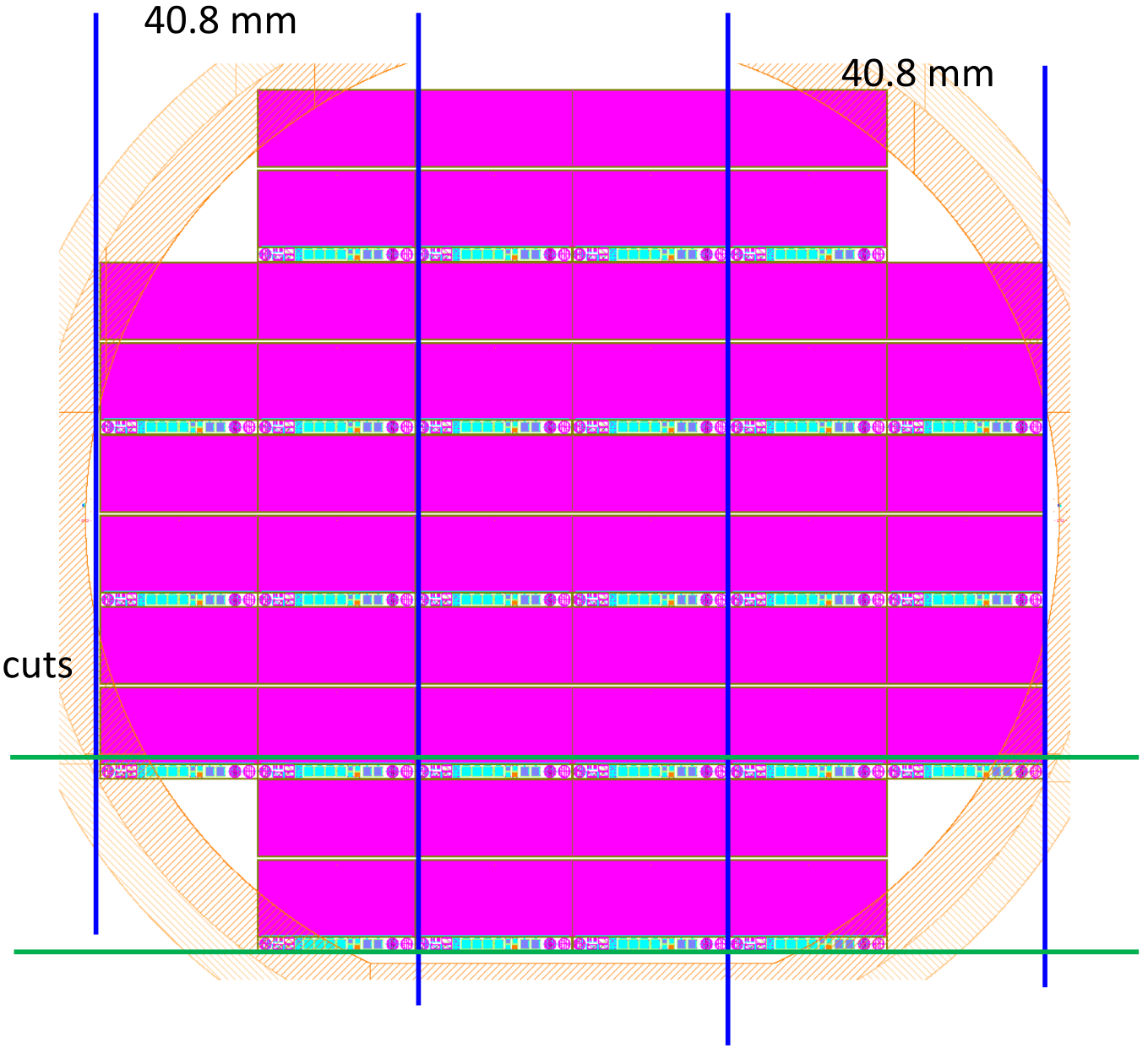
W10 Stepper_3

- 10 25x100 std
- 6 50x50

	1.48E-07	BAD	BAD	BAD	
	4.60E-08	BAD	BAD	BAD	
1.13E-07	4.45E-08	BAD	BAD	BAD	BAD
BAD	BAD	BAD	BAD	BAD	4.05E-07
3.72E-08	BAD	BAD	BAD	BAD	BAD
5.03E-08	2.17E-08	BAD	BAD	BAD	BAD
7.96E-08	BAD	BAD	BAD	BAD	1.35E-07
1.70E-07	2.51E-08	BAD	BAD	2.32E-08	1.34E-07
	BAD	BAD	BAD	BAD	
	2.31E-07	BAD	6.53E-08	BAD	

W10 Dicing

- Dicing



Blue lines: first set of cuts

Green lines: second set of cuts

24.2 mm
including top
and bottom TS

Impacchettamento

- Mettere tutto in un solo sacchetto di plietilene, separato da fogli di carta da wafer, che entri nel canale triangolare

Backup

- Layout del w10 Stepper_3