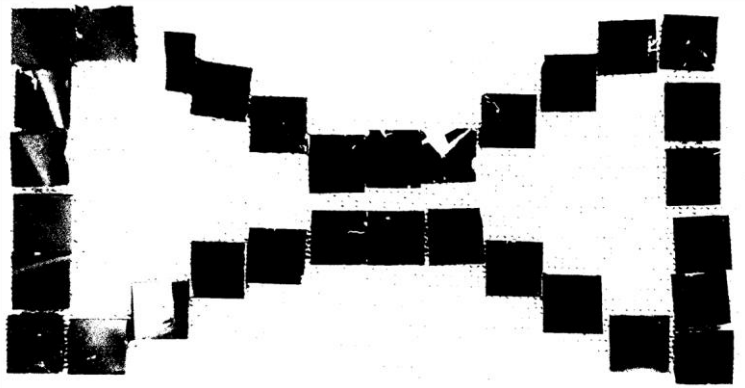
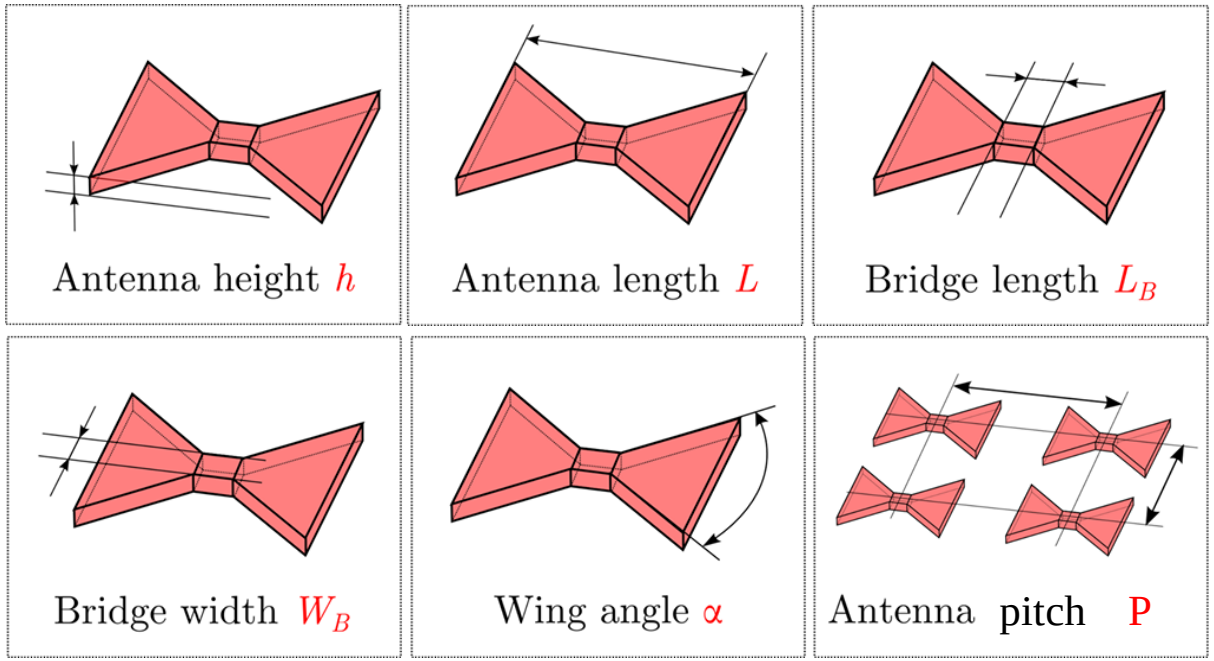
PETER – Au Diabolo

Current status



Diabolo antenna specification



Antenna length as function resonant frequency:

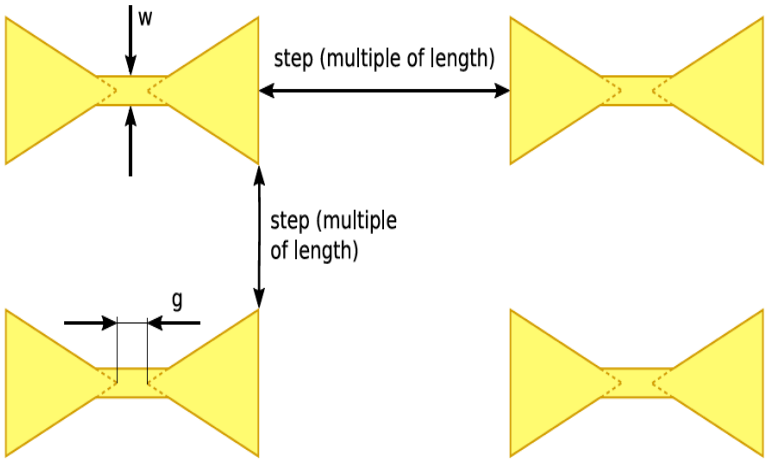
Si (Martin's model)

$$L = \frac{34067.3}{f_{res}}$$

SiO_2 (Katarina's model)

$$L = \frac{58950.4}{f_{res}}$$

1th set of samples (from CEITEC)
11.7.2017



g = the length of the bridge – tested

w = the width of the bridge – tested

step = distance between antennas

(side to side) – tested

Si-Wafer N-Ph (Intrinsic)

300 – 500 Ωcm

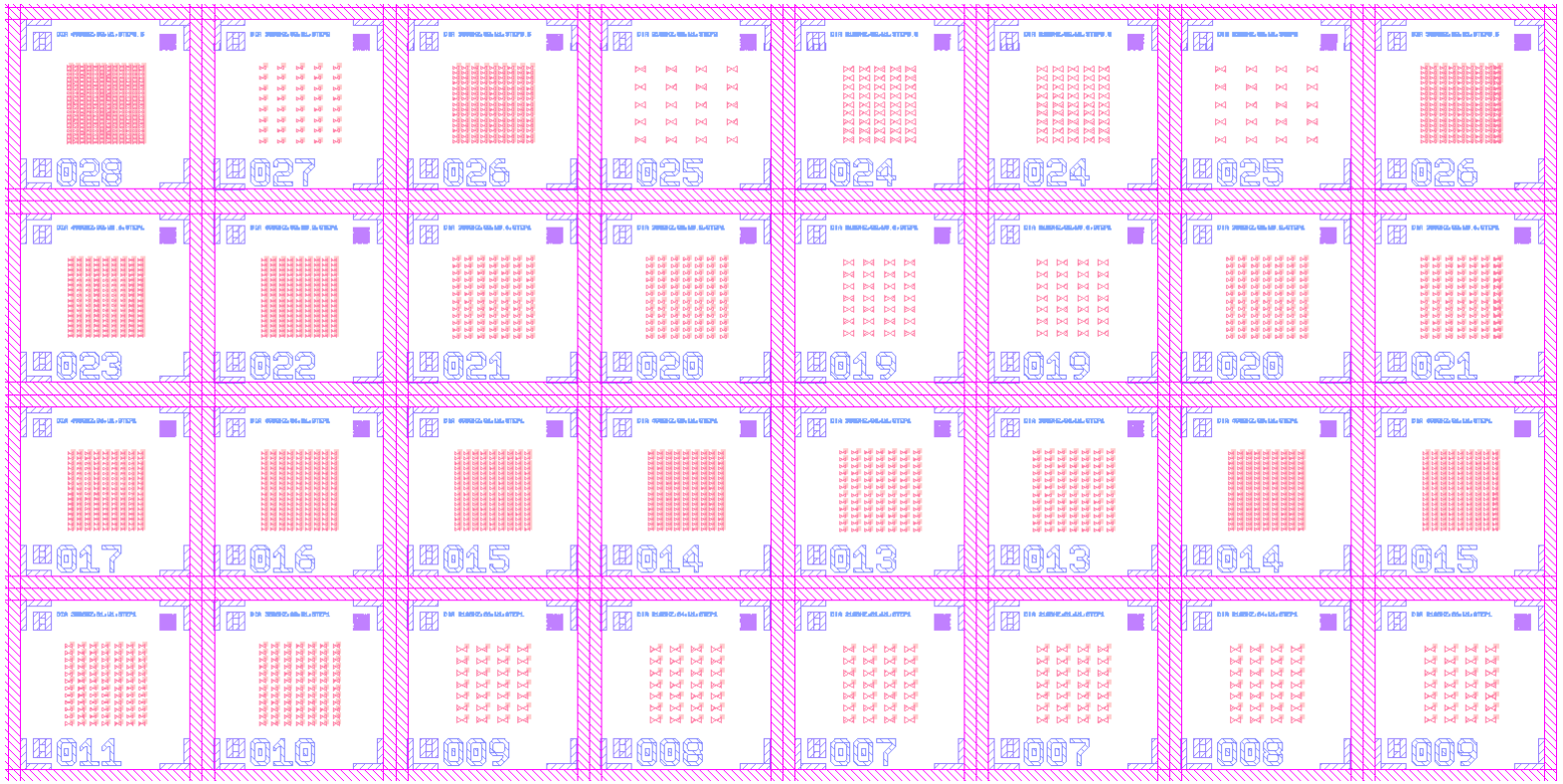
(275 ± 25) µm

SSP

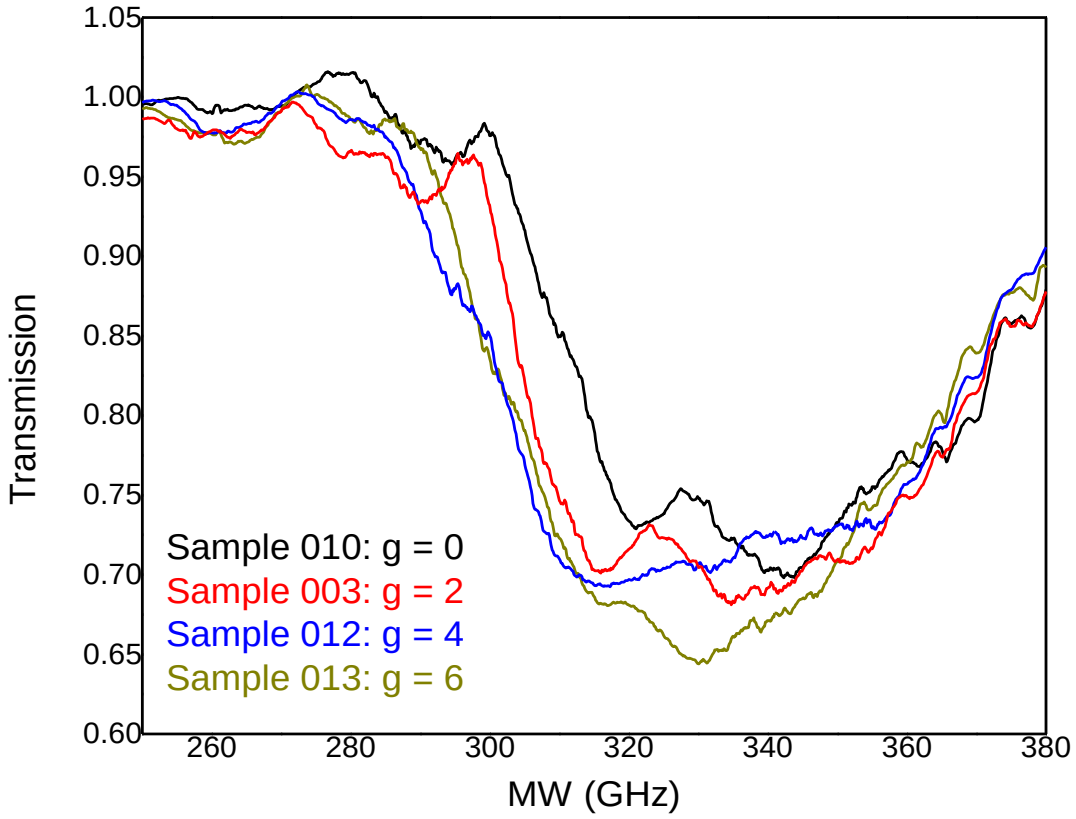
Sample No.	resonance frequency (GHz)	g (µm)	w (µm)	step
001	210	2	1.05	1
002	280	2	1.05	1
003	350	2	0.95	1
004	420	2	0.95	1
005	490	2	0.93	1
006	210	0	0.94	1
007	210	1	1.06	1
008	210	4	1.06	1
009	210	6	1.05	1
010	350	0	1.06	1
011	350	1	1.05	1
012	350	4	1.06	1
013	350	6	0.97	1
014	490	0	0.97	1
015	490	1	0.99	1
016	490	4	0.99	1
017	490	6	1.1	1
018	210	2	0.18	1
019	210	2	0.54	1
020	350	2	0	1
021	350	2	0.55	1
022	490	2	0	1
023	490	2	0.56	1
024	210	2	0.98	0.5
025	210	2	0.99	2
026	350	2	1	0.5
027	350	2	0.92	2
028	490	2	1	0.5
029	490	2	0.97	2
030	Reference			

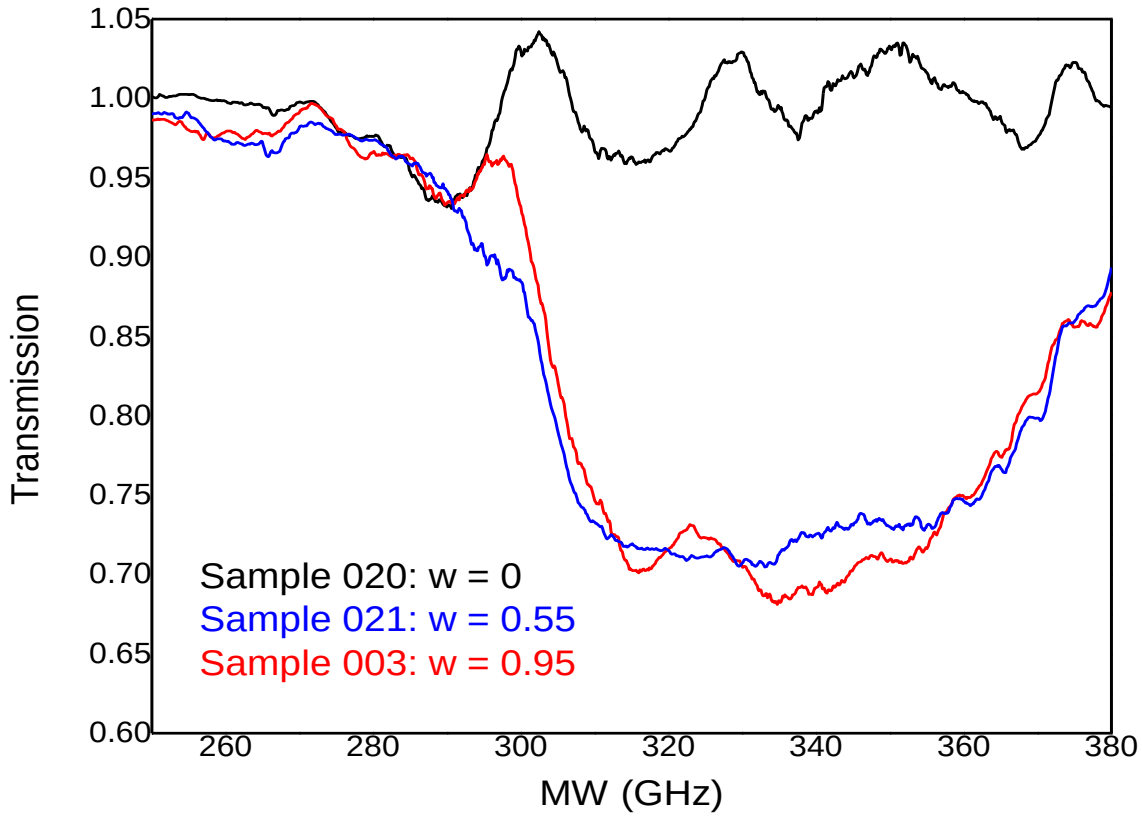
1th set of samples (from CEITEC)
11.7.2017

- 29 (58) samples
- Smaller marks

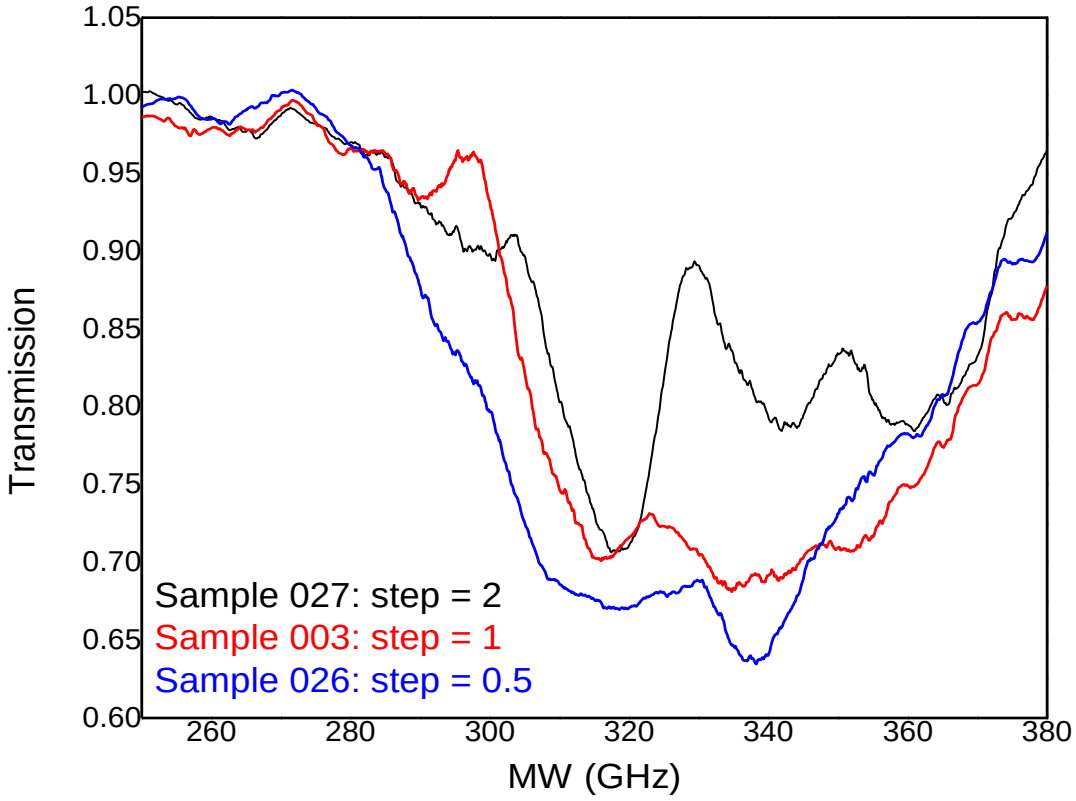


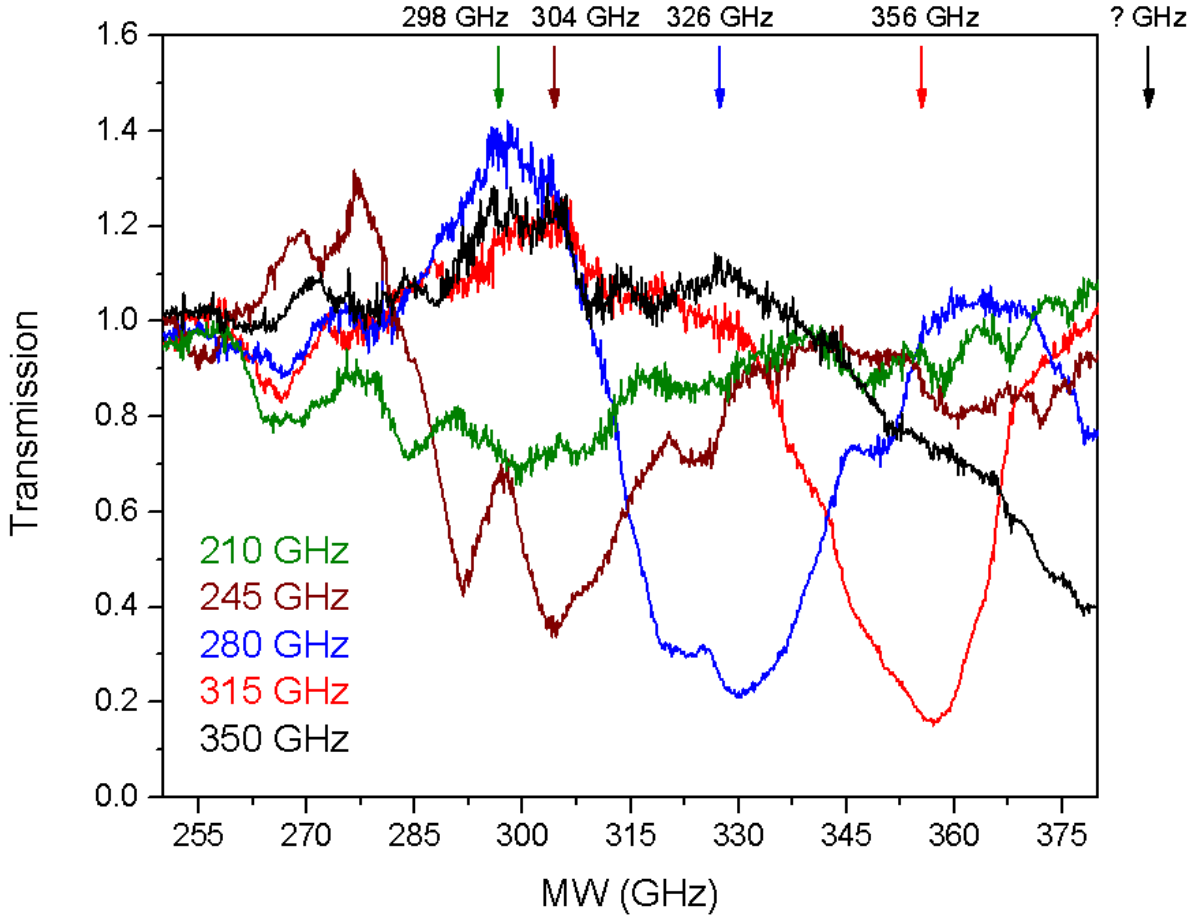
1st set of samples (from CEITEC)
(Dominik's measurements)



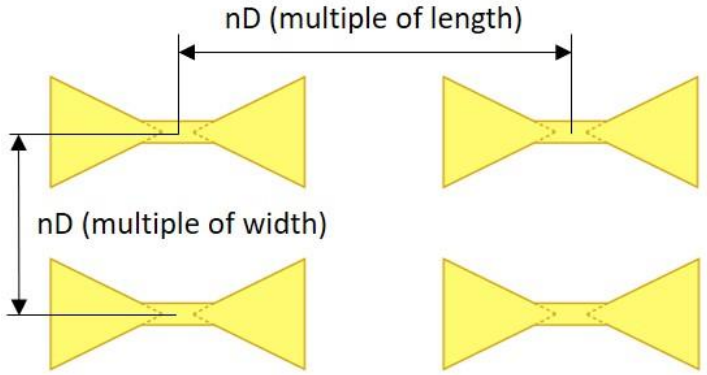


1st set of samples (from CEITEC)
(Dominik's measurements)





2nd set of samples (from CEITEC)
29.8.2018



D = dimension = length/width of antenna

(center to center)

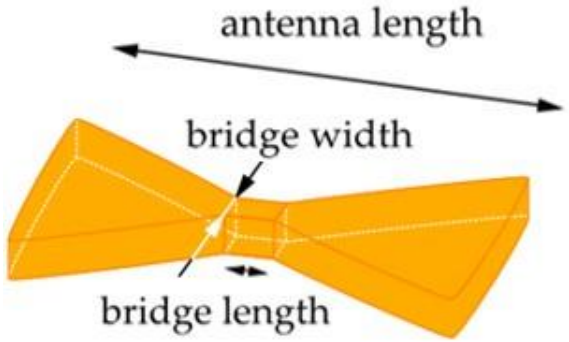
n = multiplication factor

Si-Wafer N-Ph (Intrinsic)

300 – 500 Ωcm

(275 ± 25) µm

SSP

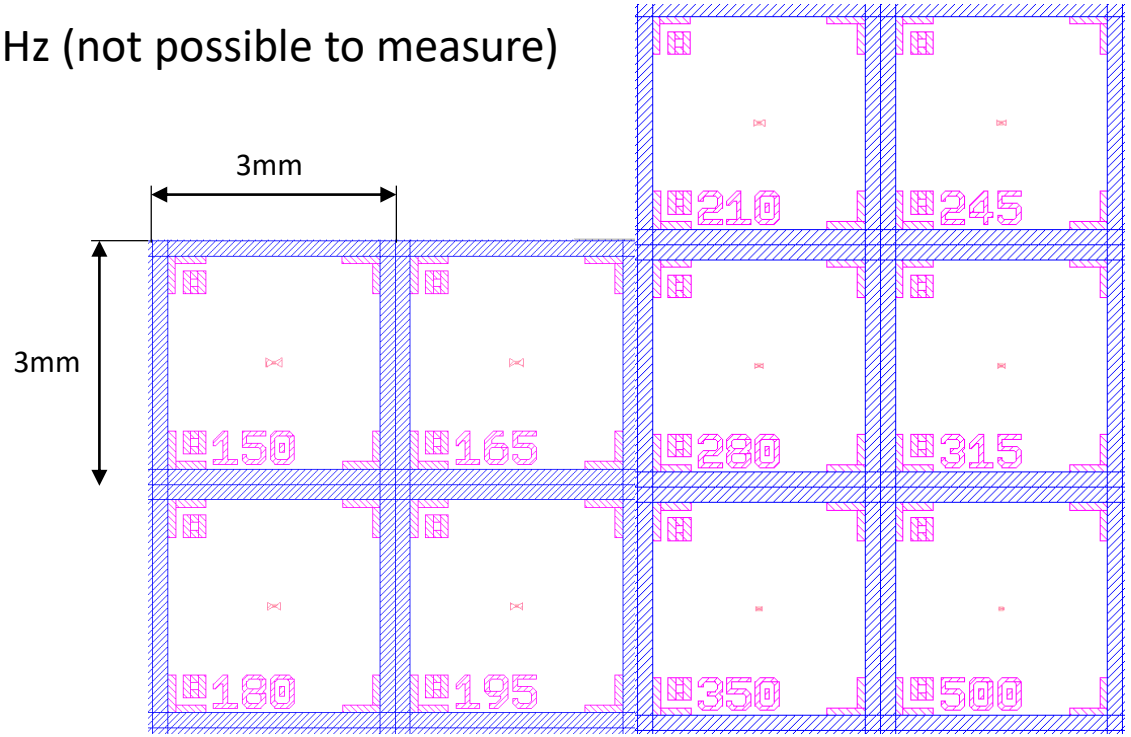


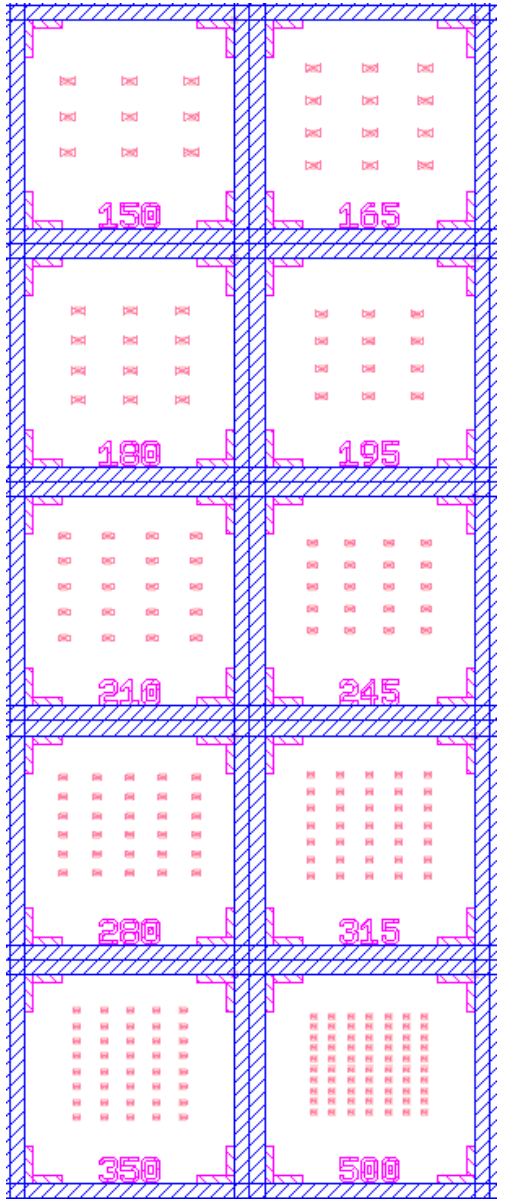
Frequency [GHz]	Antenna length [µm]	Bridge width [µm]	Bridge length [µm]
150	206.7	20.7	35.9
165	187.9	18.8	32.6
180	172.2	17.2	29.8
195	159	15.9	27.5
210	147.6	14.8	25.6
245	126.5	12.7	22.0
280	110.7	11.1	19.2
315	98.4	9.8	17.0
350	88.6	8.9	15.4
500	62	6.2	10.7

2nd set of samples (from CEITEC)
29.8.2018

- 20 samples

- No marks
- No more single antennas (no signal)
- No more 150GHz, 165 GHz (not possible to measure)

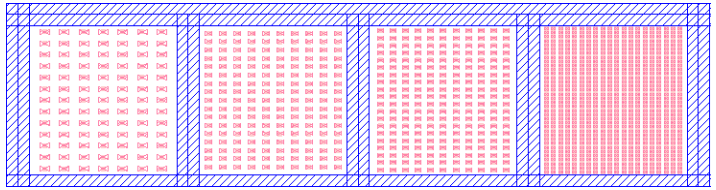




3rd set of samples (from CEITEC)
4.2.2019

Fixed Pitch 2L

180 GHz 245 GHz 280 GHz 500 GHz



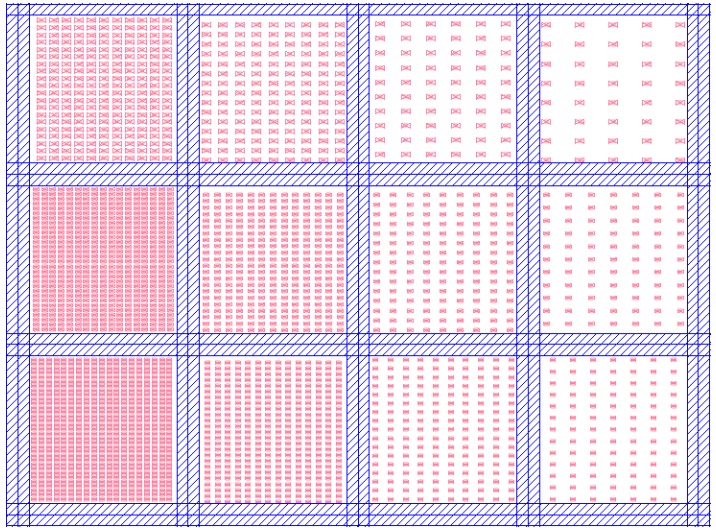
Pitch (distance between centers)

1,5L 2L 3L 4L

210 GHz

315 GHz

350 GHz



Si-Wafer N-Ph (Intrinsic)

>10 kΩcm

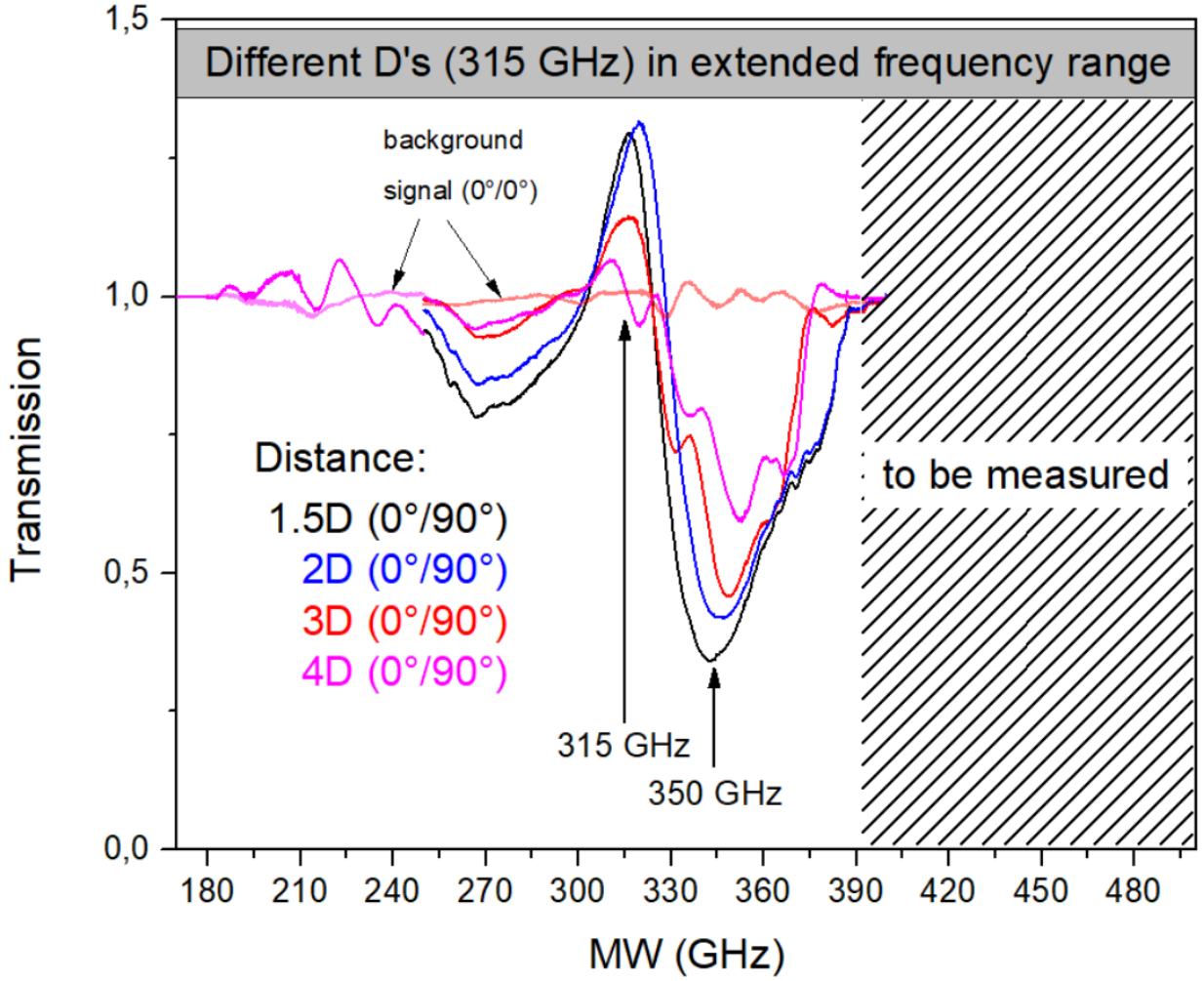
(525 ± 25) µm

DSP

- 38 samples
- No DSP
- Quartz, Fused Silica

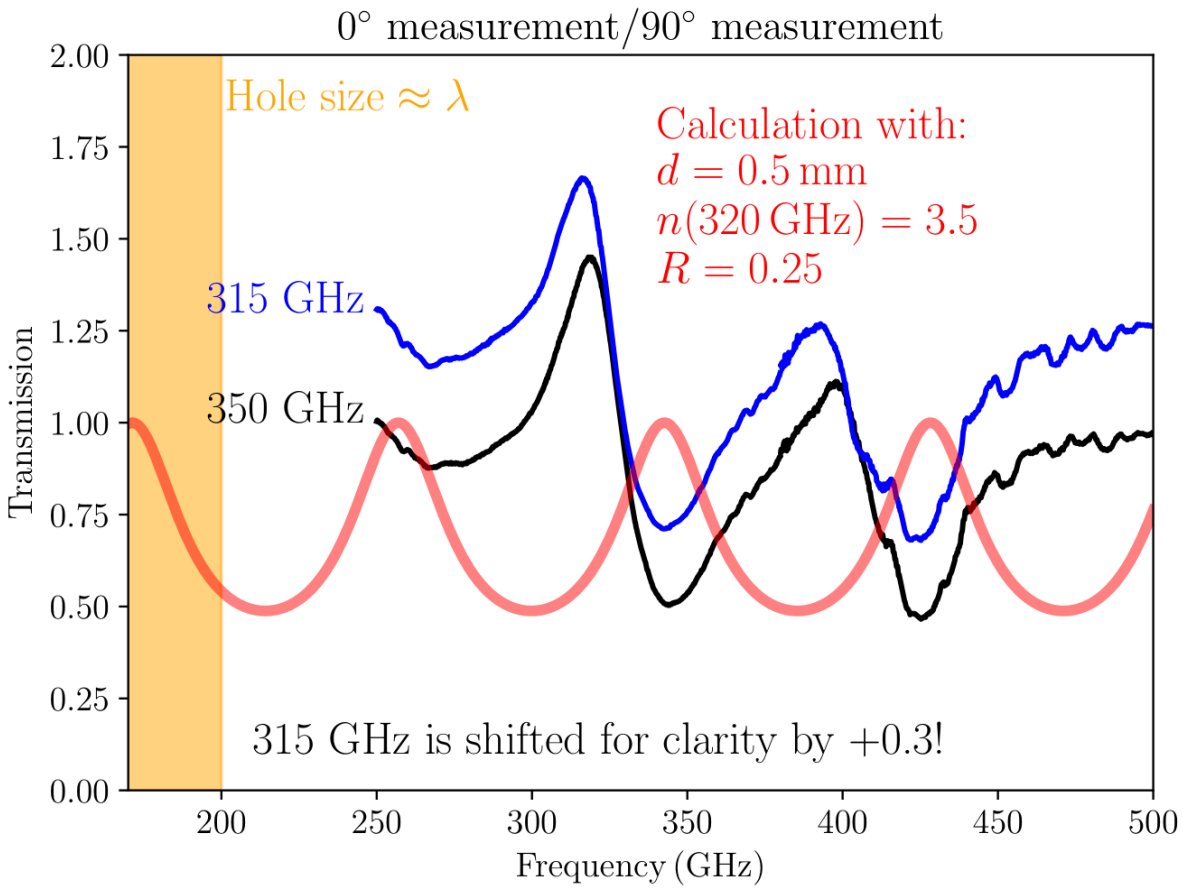
Frequency [GHz]	Antenna length [µm]	Bridge width [µm]	Bridge length [µm]
180	172.2	17.2	29.8
210	147.6	14.8	25.6
245	126.5	12.7	22.0
280	110.7	11.1	19.2
315	98.4	9.8	17.0
350	88.6	8.9	15.4
500	62	6.2	10.7

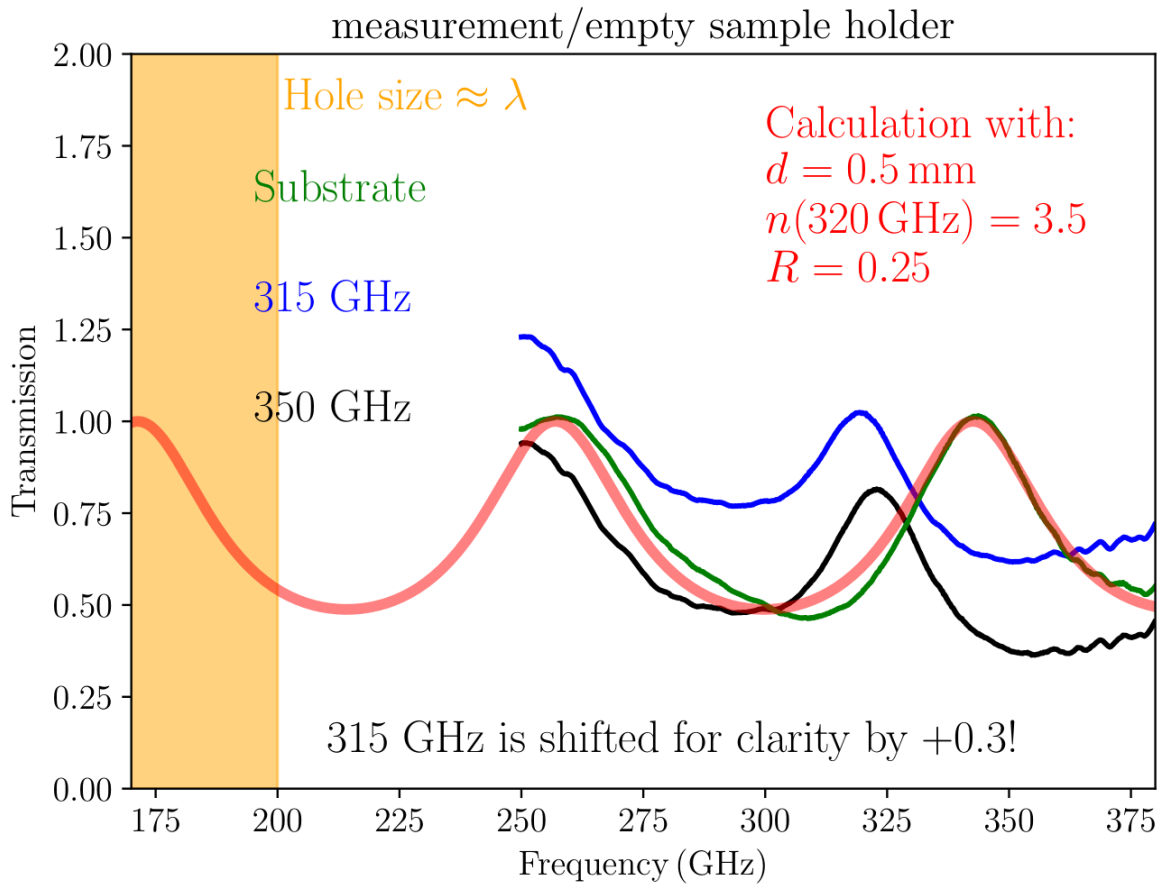
3rd set of samples (from CEITEC) (Dominik's measurements)



3rd set of samples (from CEITEC) (Dominik's measurements)

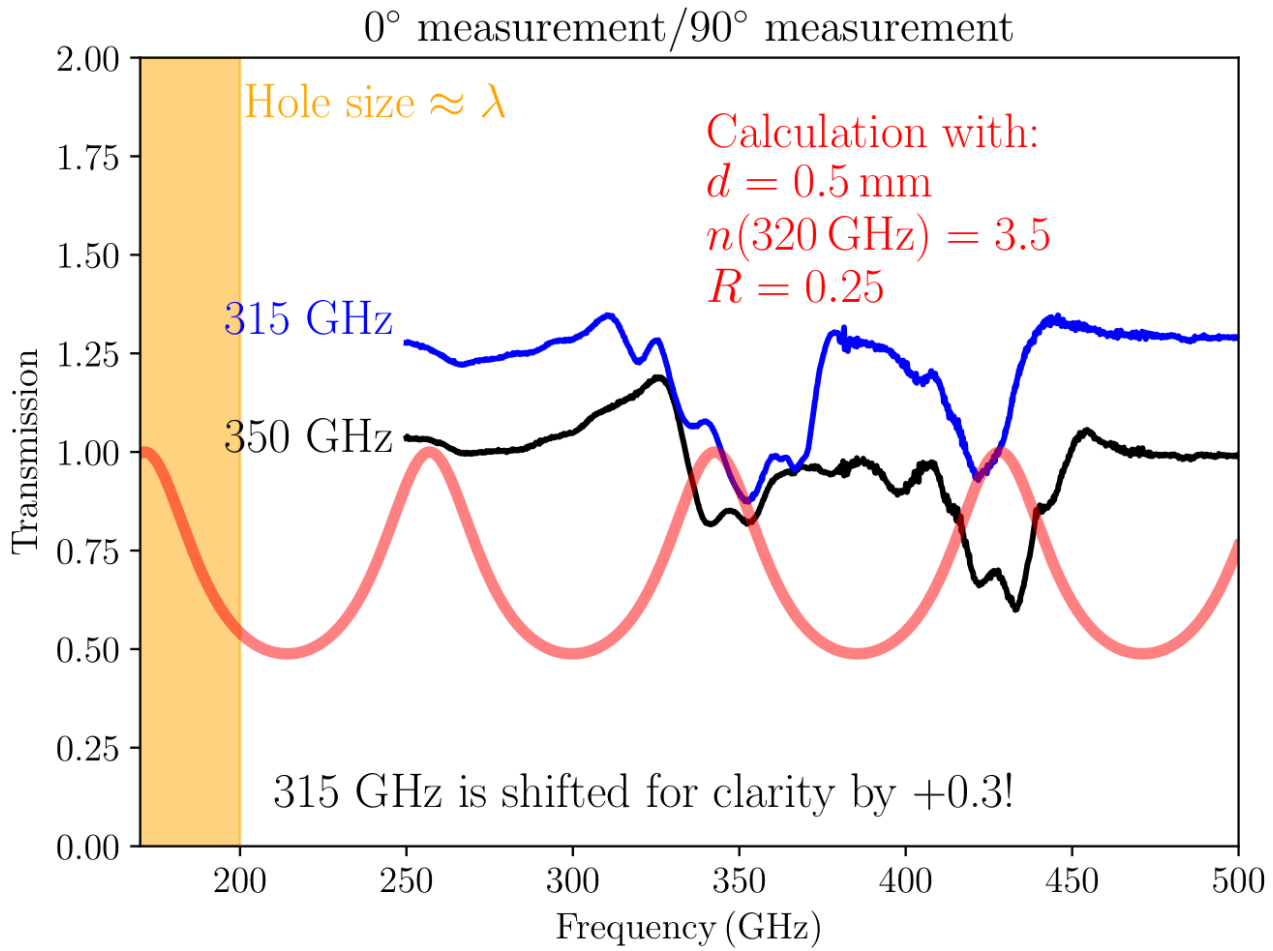
Pitch = 1.5L





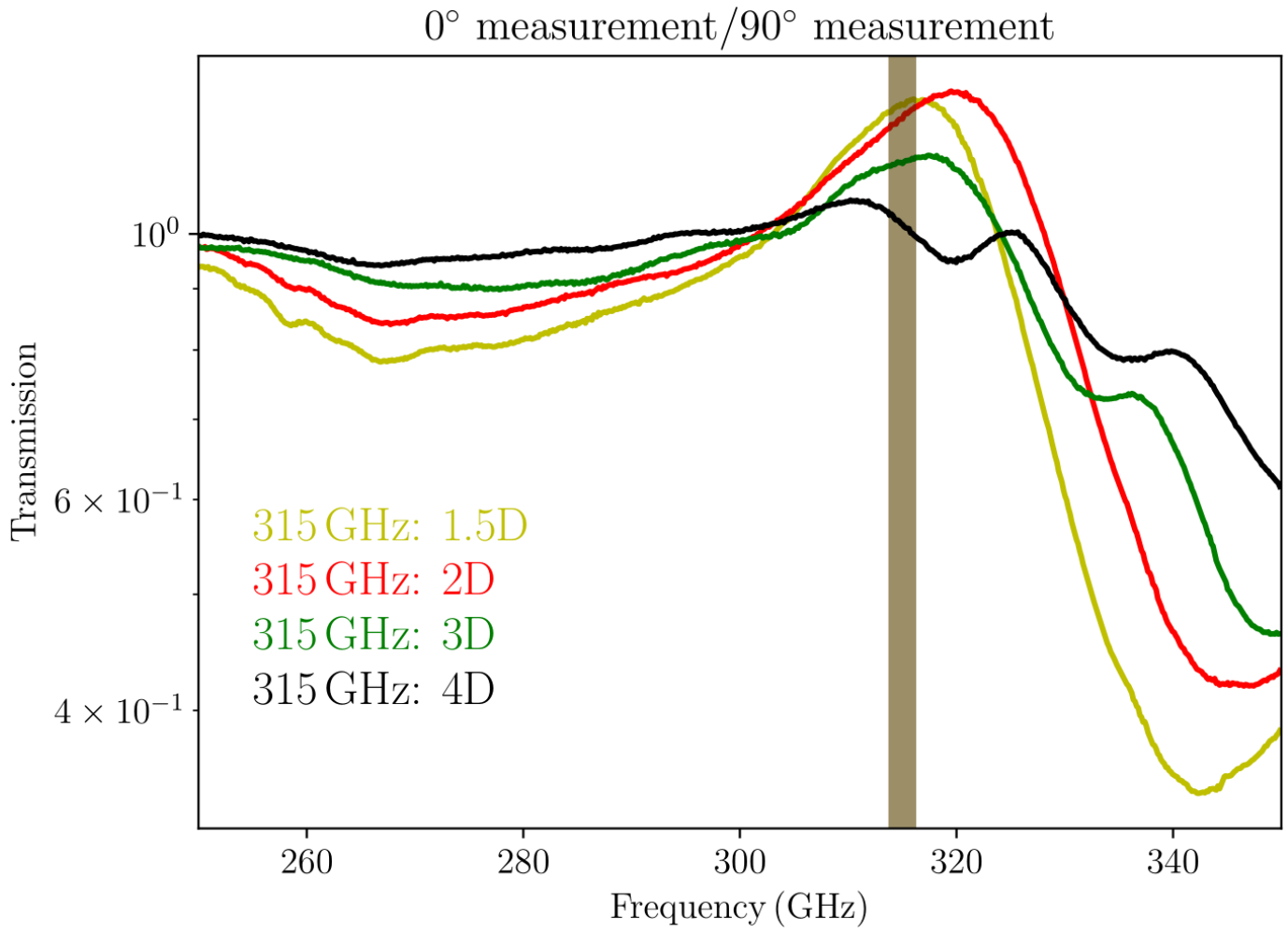
3rd set of samples (from CEITEC) (Dominik's measurements)

Pitch = 4L



3rd set of samples (from CEITEC) (Dominik's measurements)

315 GHz



4th set of samples (from Nanogune)
9.4.2019

Pitch 2L

SiO_2 (Quartz)

- kΩcm

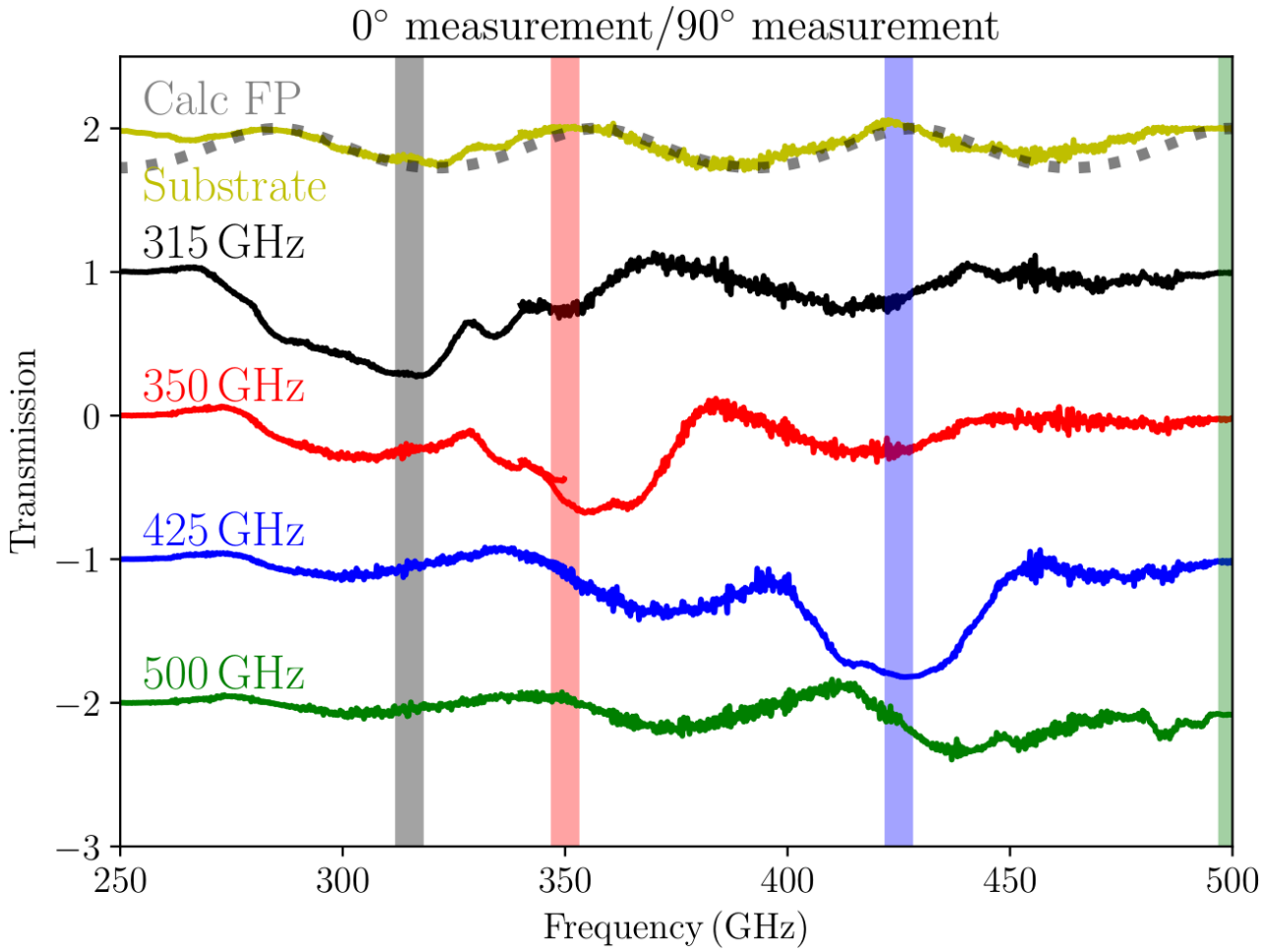
(1000 ± 50) µm

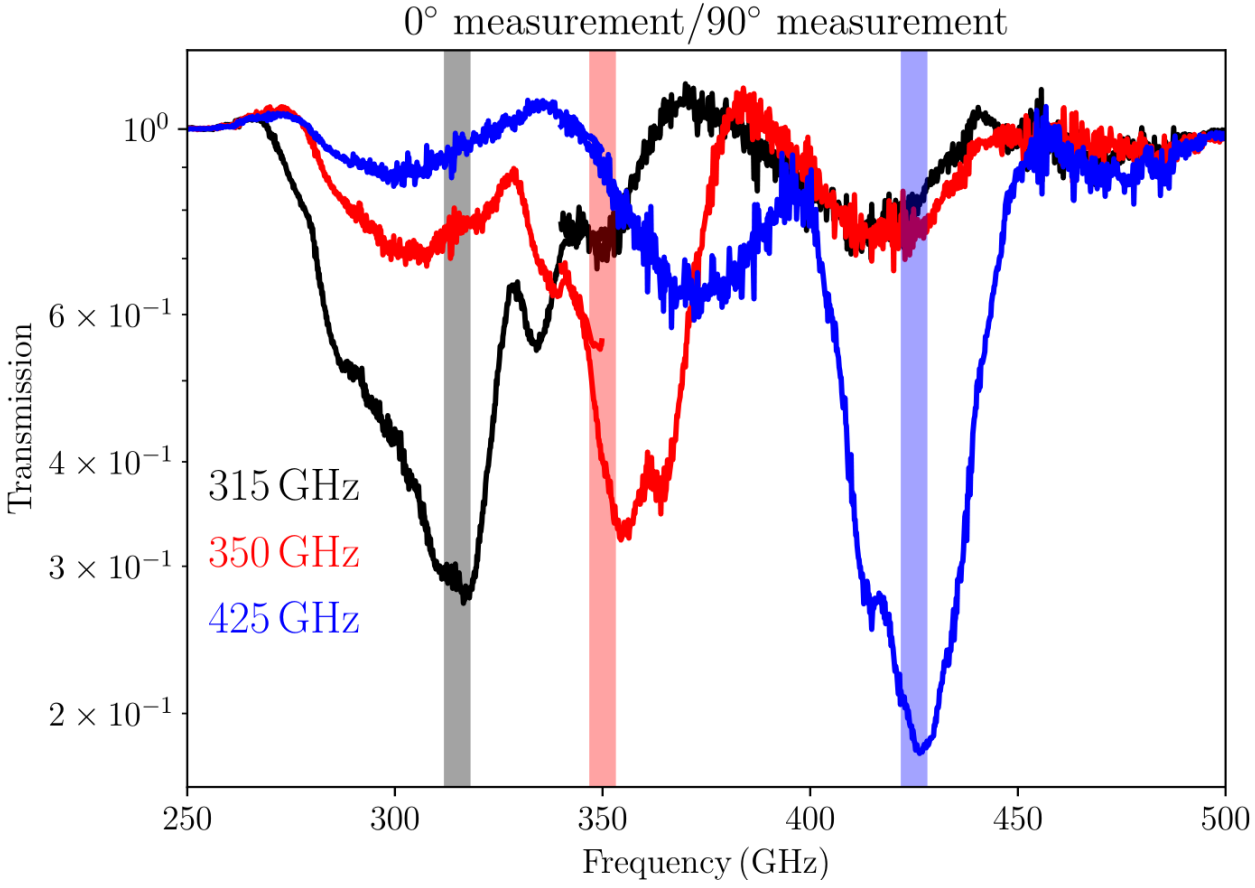
DSP

- 4 samples
- Cut into 4 x (3x3) mm

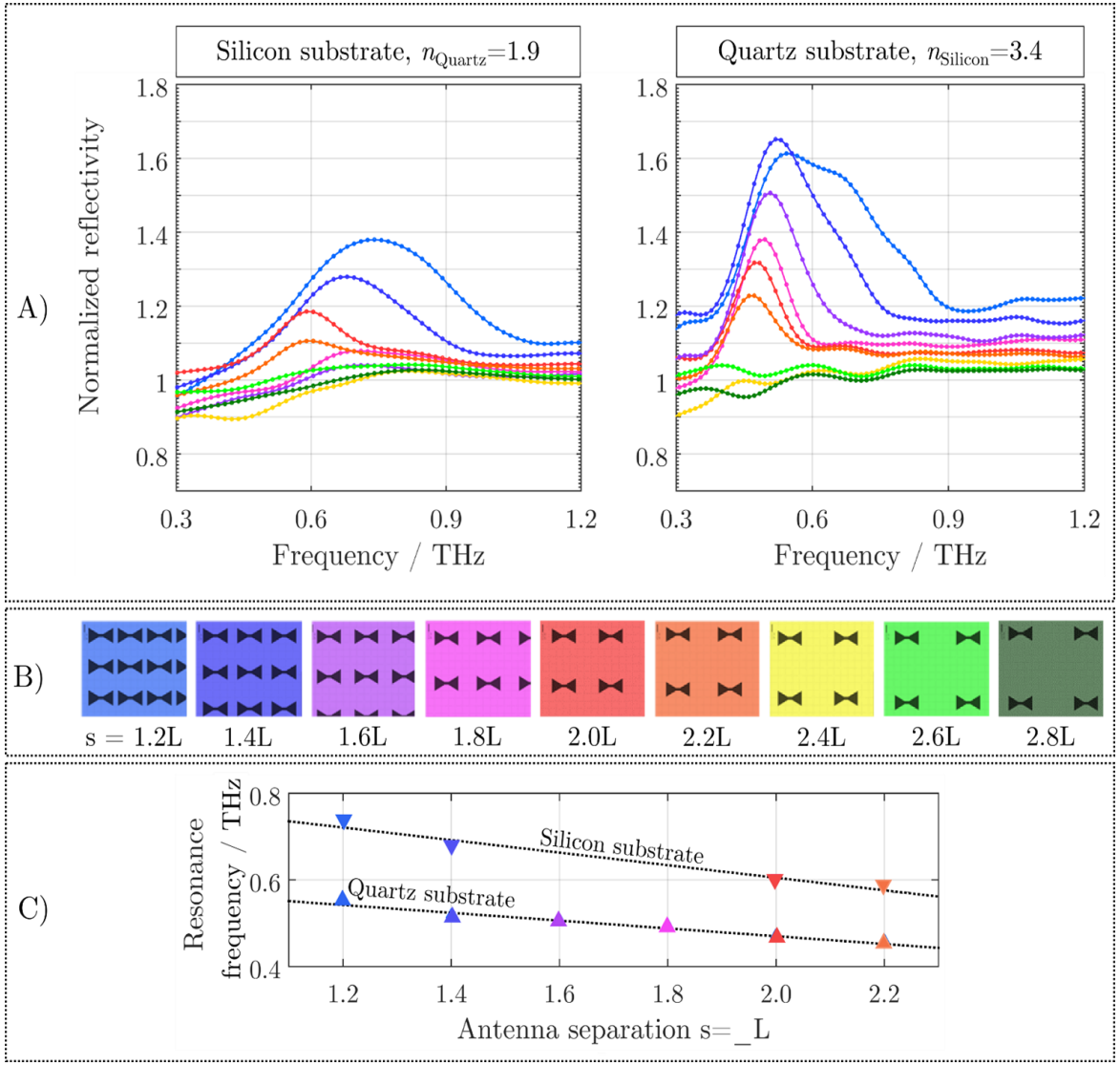
- No problem

4th set of samples (from Nanogune)
(Dominik's measurements)

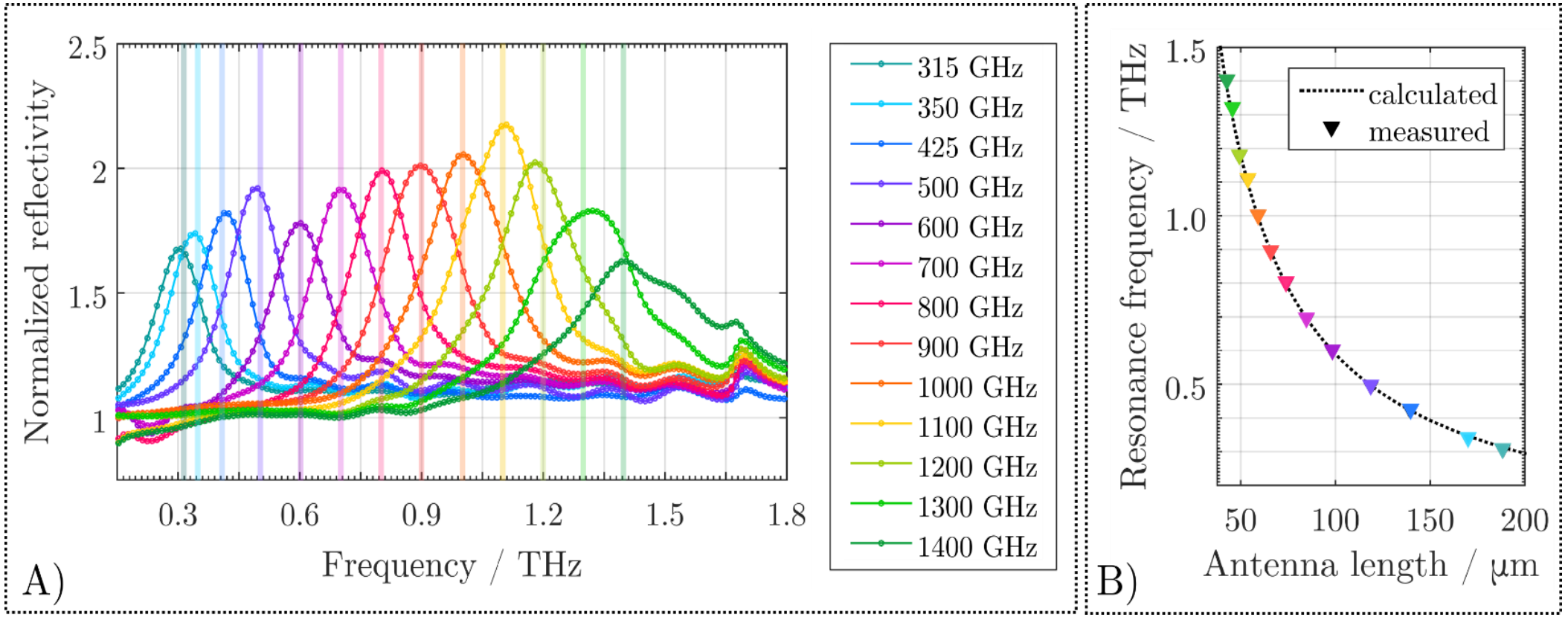




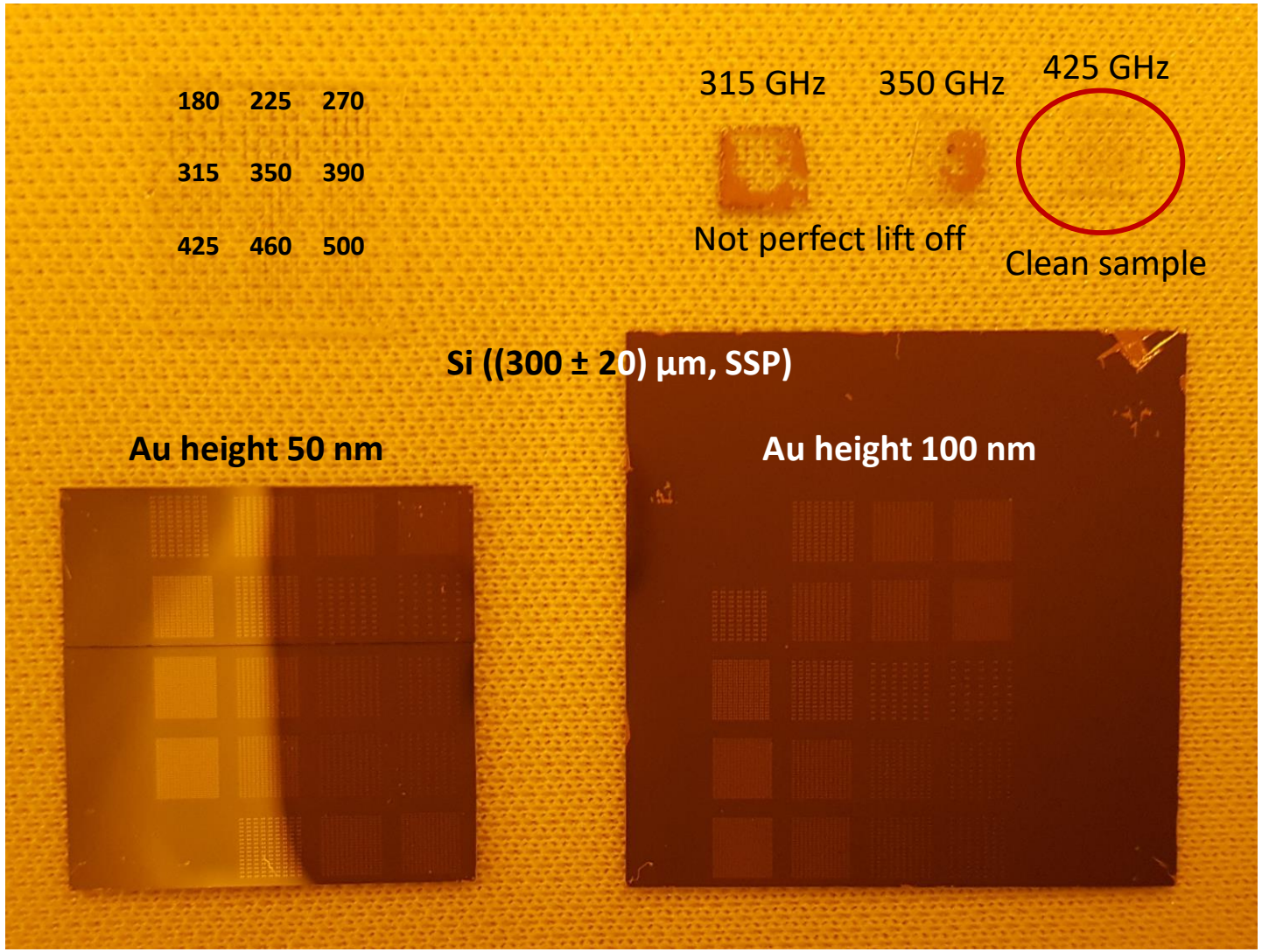
4th set of samples (from Nanogune) (Katarina's measurements)



4th set of samples (from Nanogune)
(Katarina's measurements)



5th set of samples (from CEITEC Brno)
20.6.2019



SiO_2 (Fused Silica)

- kΩcm

(300 ± 20) µm

DSP

Si-Wafer N-Ph

300 – 500 Ωcm

(300 ± 20) µm

SSP

- 50 samples