OpenPICs WP3

Agenda - Part I (start 14:00)

1. **Last meeting's action points**
2. **Progress and issues to be raised per partner**
   a. **TU/e**
   b. **Smart Photonics**
   c. **Bright Photonics**
   d. **Effect Photonics**
   e. **Technobis**
3. **Summary**

SP 22

Chips WP3

MPW parallel chips | MPW commercial chips | (x) = reserve space for design

		SP19	SP20	SP21	SP22	SP23	SP24	SP25	SP26	SP27	SP28	SP29	SP30
		Dec-16	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19
Modulator			1st					2nd			3rd		
	Plating chip + parameter extraction	x		x		x		x					
	Modulator chip (Effect+SI+plating)			x	x	x	x	→WP2					
	Al-MQW parallel wafer							x	x	x	x	→WP2	
	CL-TWE chip										x	x	x
RF Line	Conventional design				x	x	x			x	x	x	
	2nd level metal RF line				x	x	x	x	x				
BB test cell	Wafer level test		x	x	x	x	x	x	x	x	x	x	x
	Die level test		x	x	x	x	x	x	x	x	x	x	x
	Composite BBs				x								
Prec. Filter	(ring, AWG, MZI)			?			?			?			
Low LW LD													
	DBR laser				x		x		x		x		x
	Triplex Hybrid				X (tbd)								
	High Q cavity laser									?			
Demo	both chips								x				

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Photonic Integration Technology Centre

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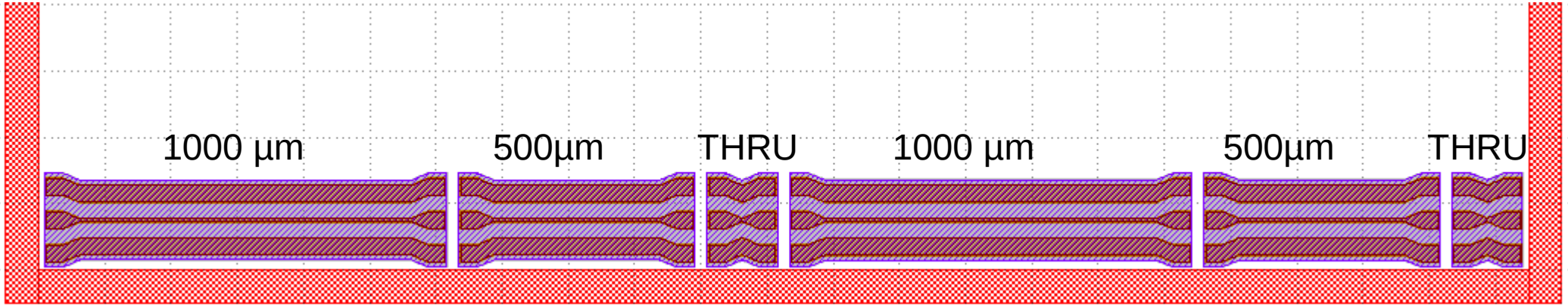
Conventional RF Line BB

- Not a standard RF Line BB yet. PDK has the attached one to RF modulator
- Performed tests on different geometries
- Systematic tests needed
- Simulation optimum has been found

Conventional RF Line BB



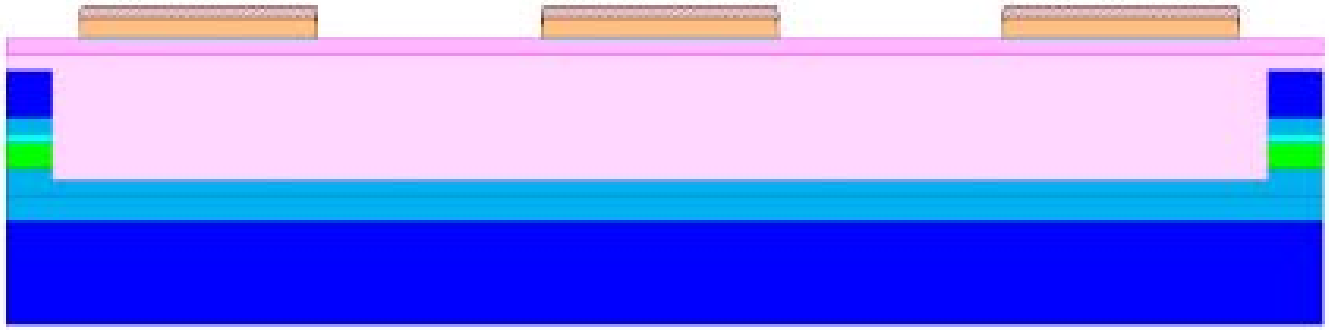
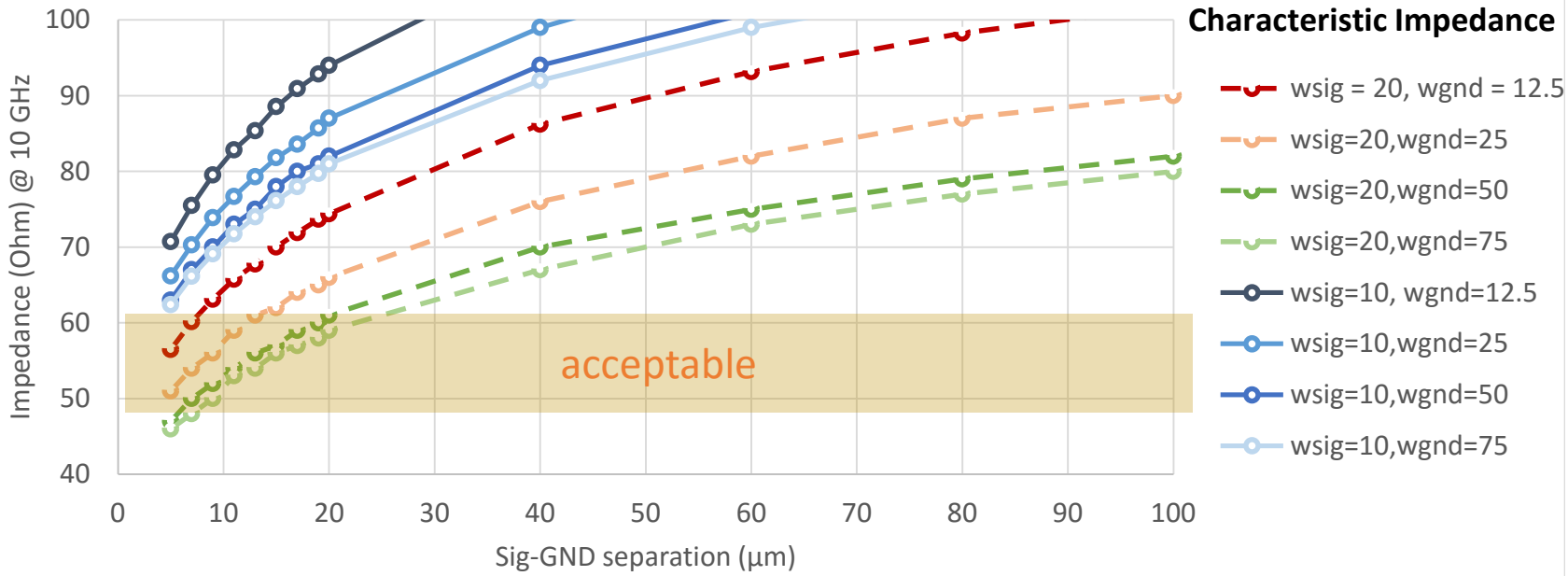
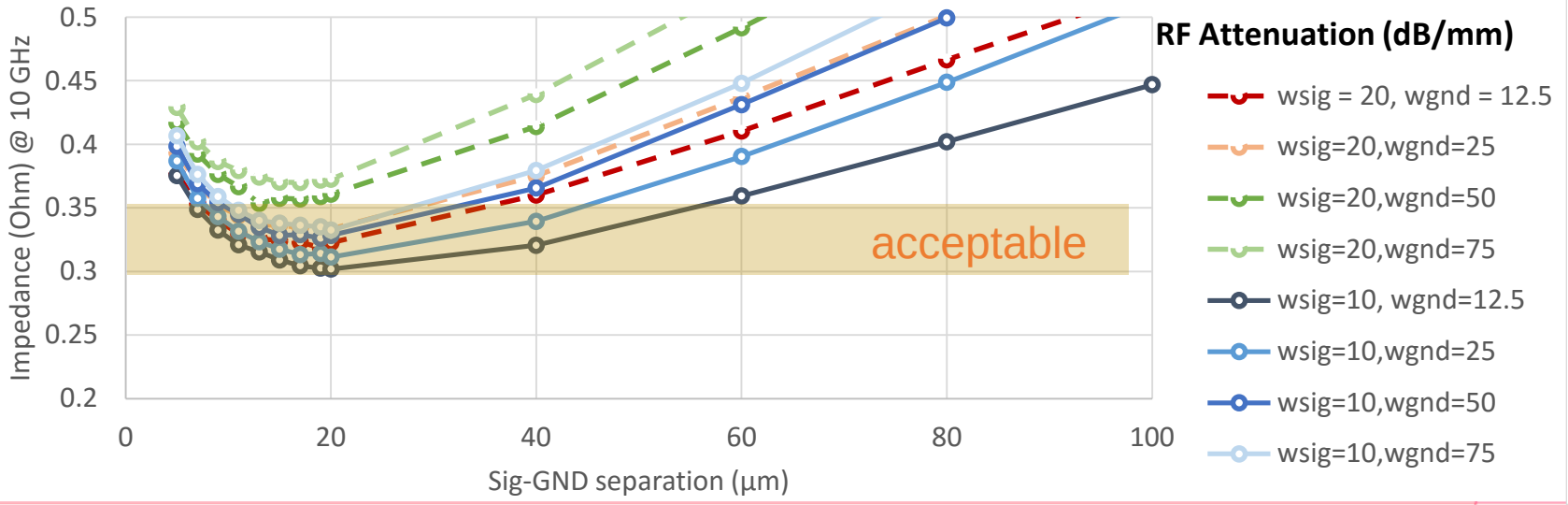
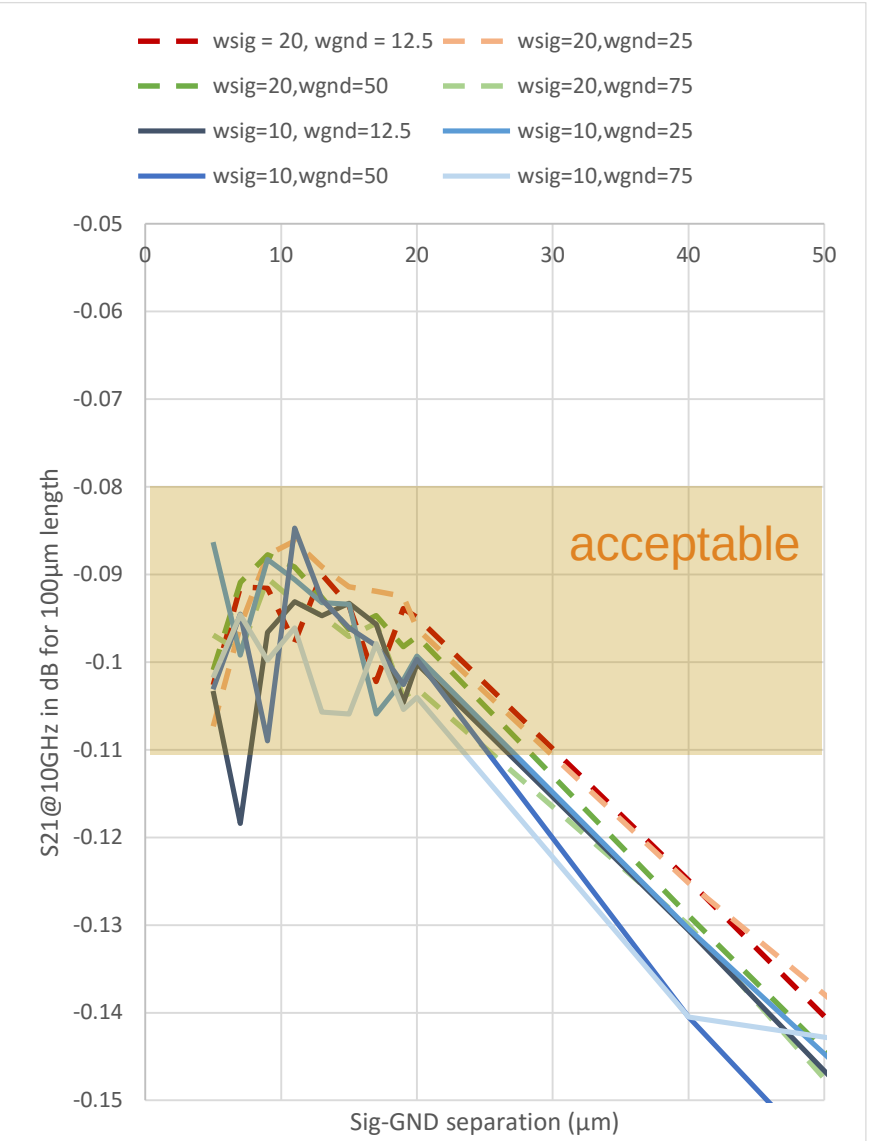


Figure 12.1: Cross-section of a GSG CPW pad.

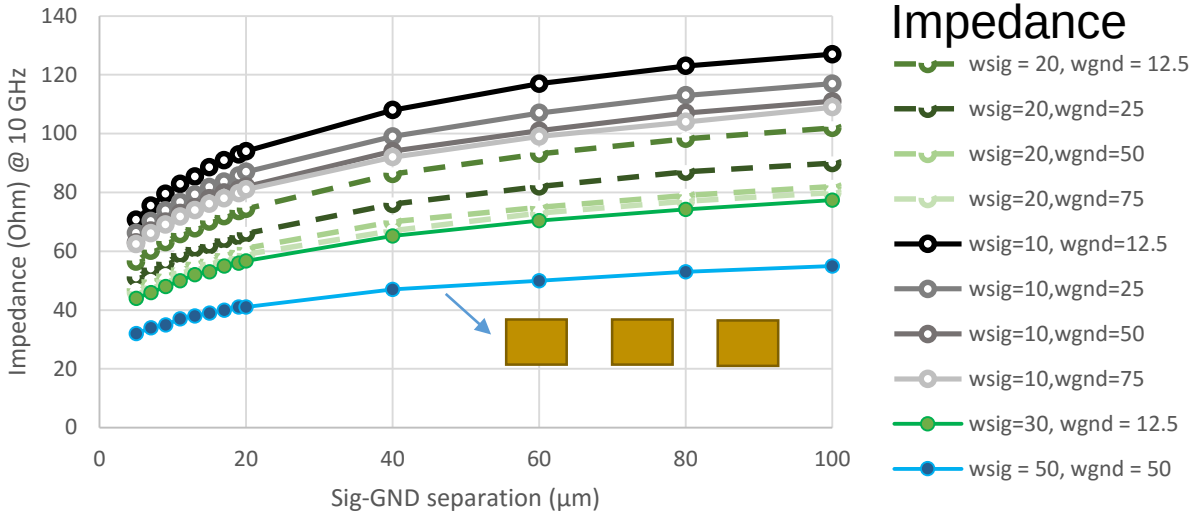
Parameters


Characteristic Impedance
Impedance (Ohm) @ 10 GHz
Sig-GND separation (µm)
acceptable
wsig = 20, wgnd = 12.5
wsig=20,wgnd=25
wsig=20,wgnd=50
wsig=20,wgnd=75
wsig=10, wgnd=12.5
wsig=10,wgnd=25
wsig=10,wgnd=50
wsig=10,wgnd=75


RF Attenuation (dB/mm)
Impedance (Ohm) @ 10 GHz
Sig-GND separation (µm)
acceptable
wsig = 20, wgnd = 12.5
wsig=20,wgnd=25
wsig=20,wgnd=50
wsig=20,wgnd=75
wsig=10, wgnd=12.5
wsig=10,wgnd=25
wsig=10,wgnd=50
wsig=10,wgnd=75

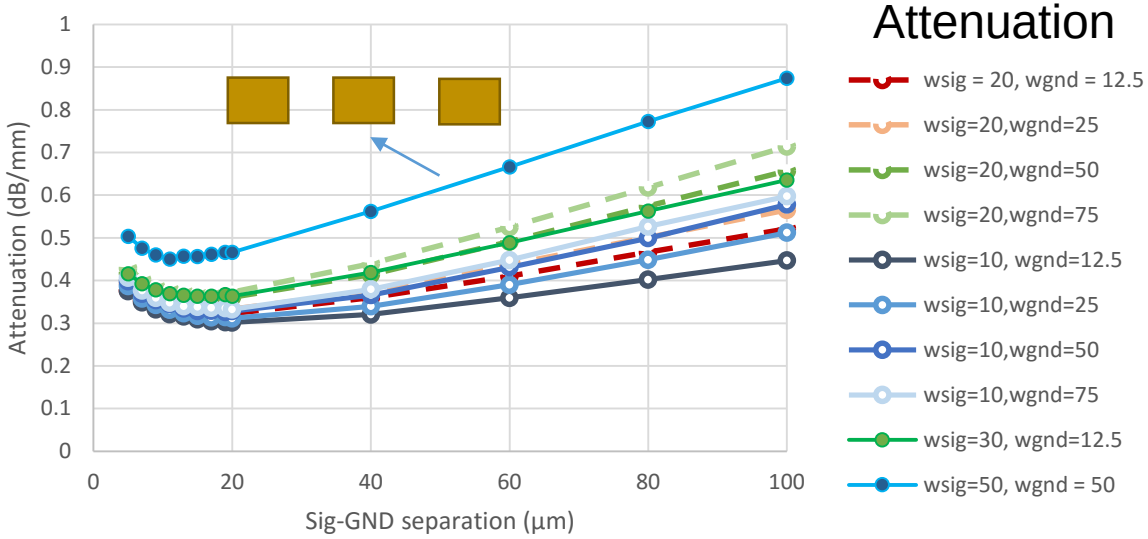

S21@10GHz in dB for 100µm length
Sig-GND separation (µm)
acceptable
wsig = 20, wgnd = 12.5
wsig=20,wgnd=25
wsig=20,wgnd=50
wsig=20,wgnd=75
wsig=10, wgnd=12.5
wsig=10,wgnd=25
wsig=10,wgnd=50
wsig=10,wgnd=75

Extended RF line range (going to pad sizes)



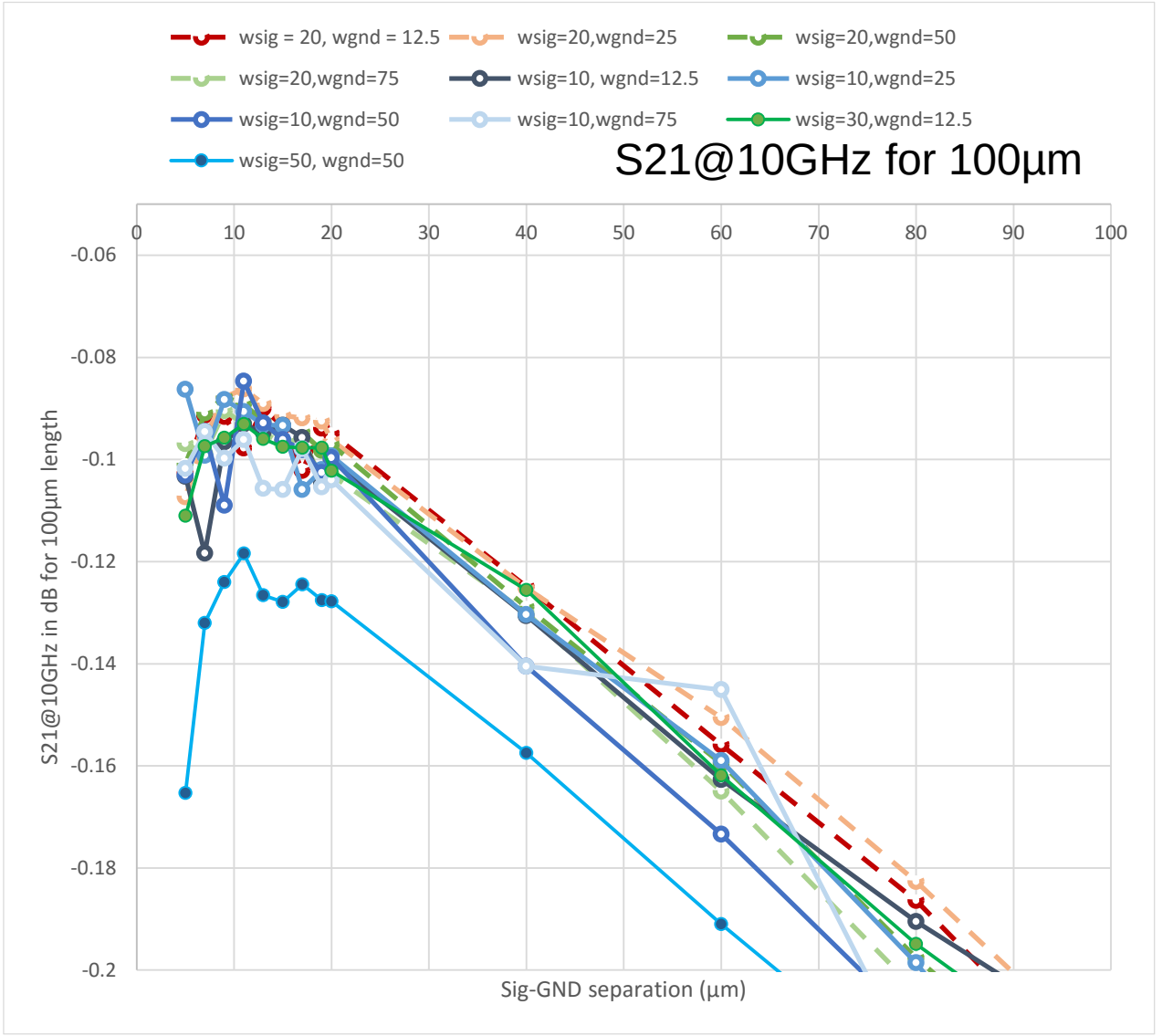
Impedance

- wsig = 20, wgnd = 12.5
- wsig=20,wgnd=25
- wsig=20,wgnd=50
- wsig=20,wgnd=75
- wsig=10, wgnd=12.5
- wsig=10,wgnd=25
- wsig=10,wgnd=50
- wsig=10,wgnd=75
- wsig=30, wgnd = 12.5
- wsig = 50, wgnd = 50



Attenuation

- wsig = 20, wgnd = 12.5
- wsig=20,wgnd=25
- wsig=20,wgnd=50
- wsig=20,wgnd=75
- wsig=10, wgnd=12.5
- wsig=10,wgnd=25
- wsig=10,wgnd=50
- wsig=10,wgnd=75
- wsig=30, wgnd=12.5
- wsig=50, wgnd = 50



Conclusions

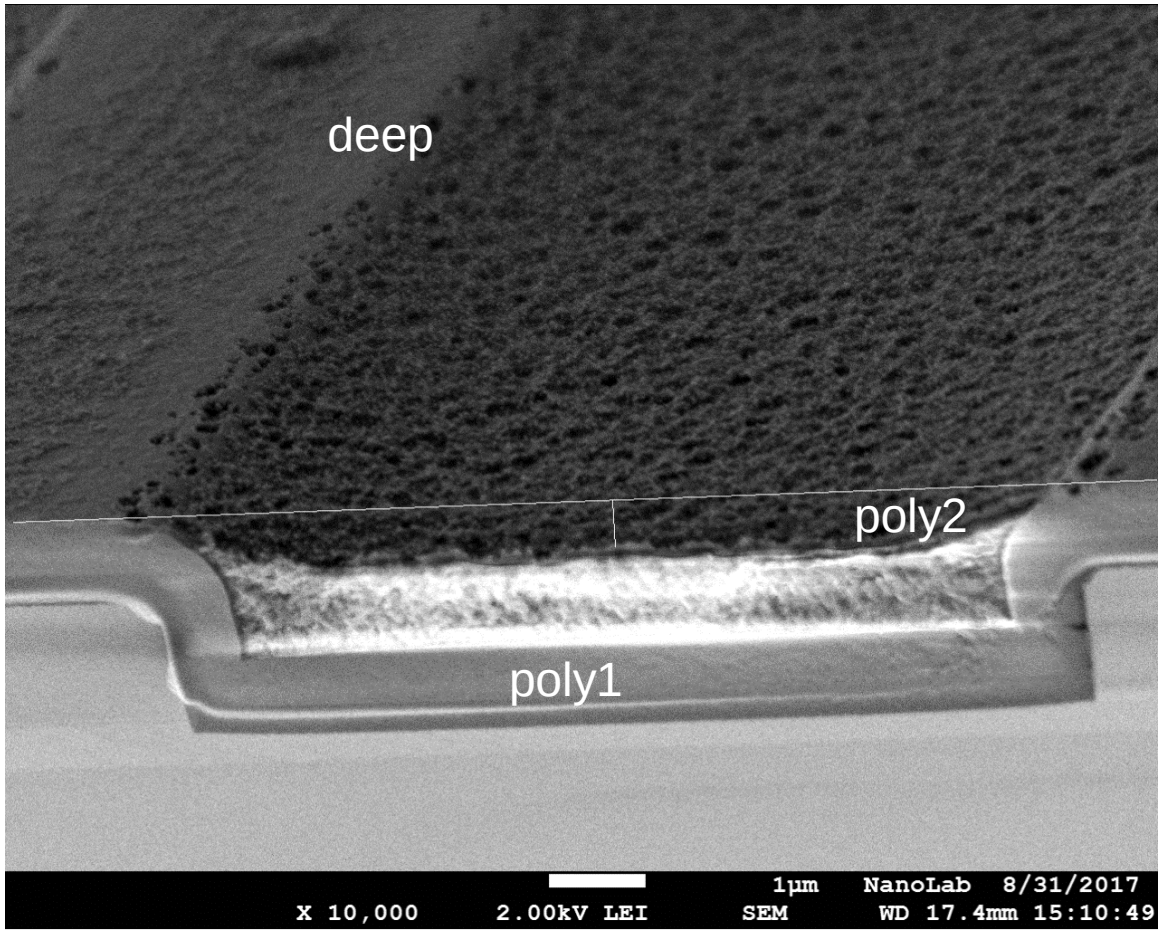
- 20 µm signal width seems more appropriate
- Sig-gnd separation <20 µm but also >8 µm to reduce attenuation
- 20-10-25 seems to be a good candidate

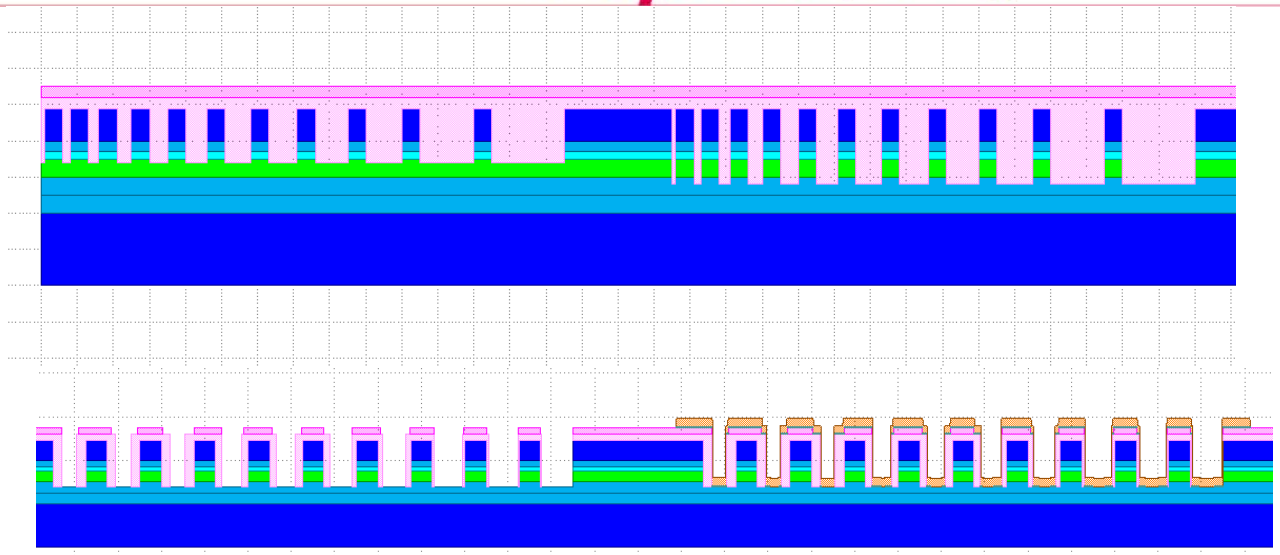
- DOE range
- Sig-gnd 5-20

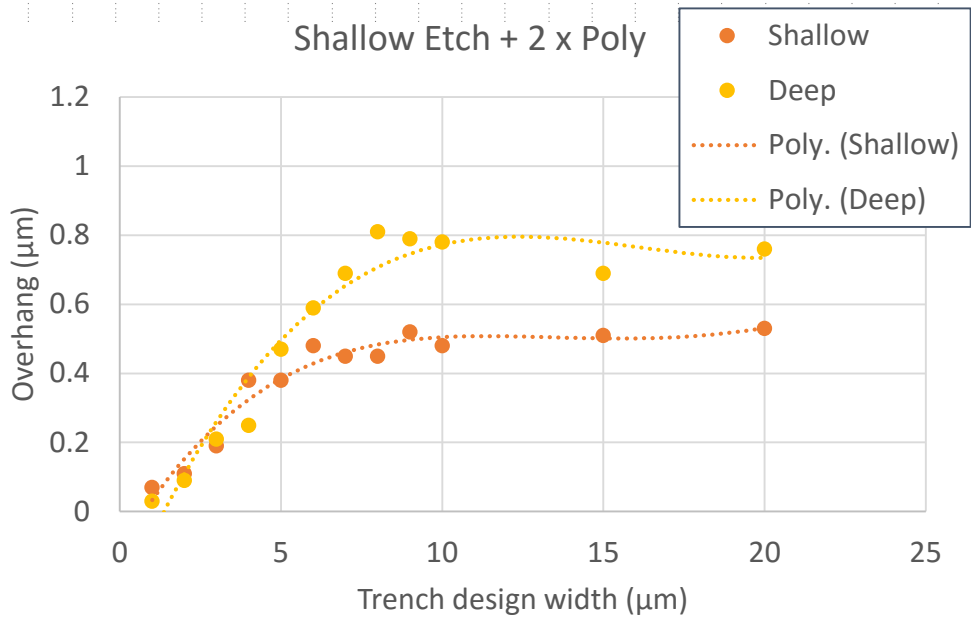
Composite BB test cell

- EAM
- MZM
- Widely tunable laser
- DBR laser
- CC laser

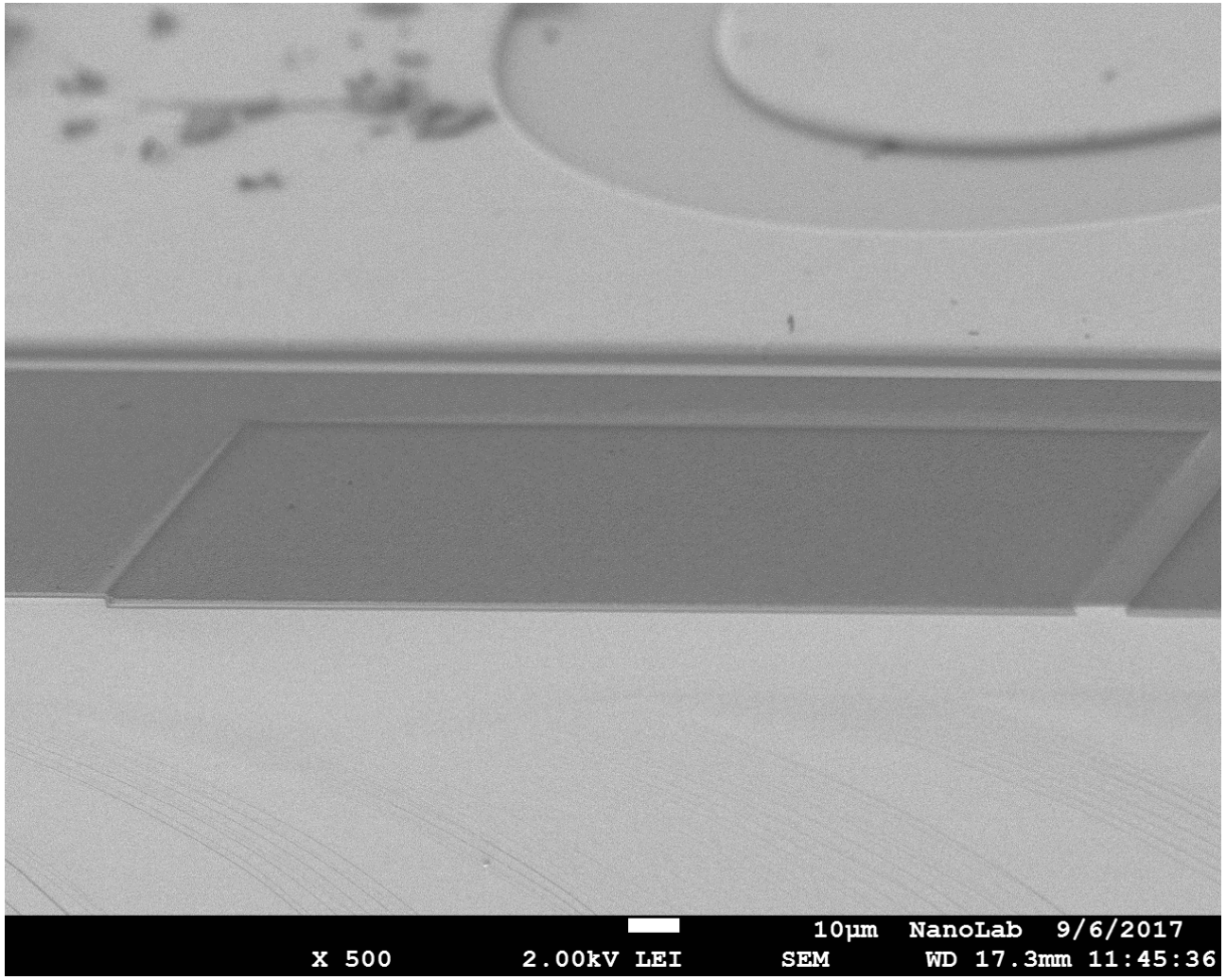
SP19 Results



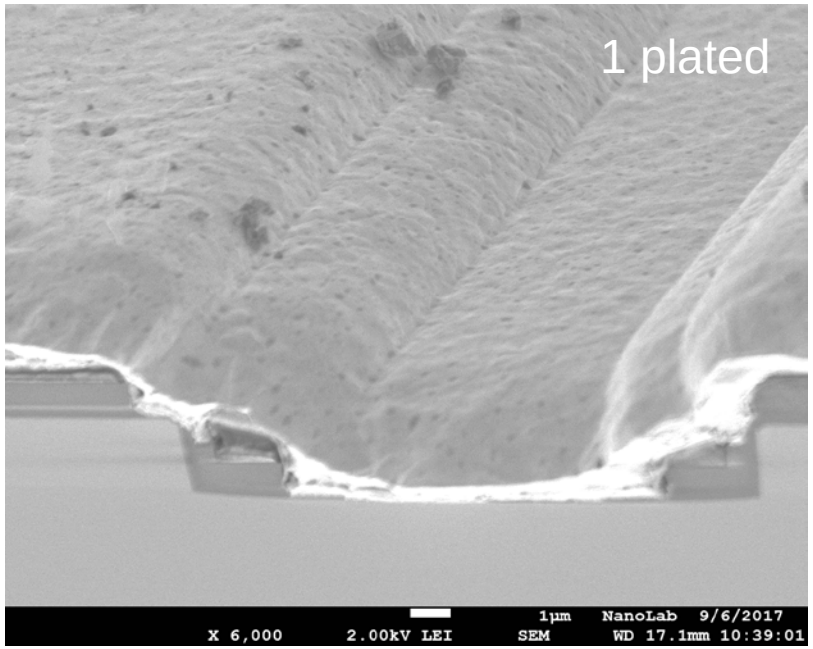


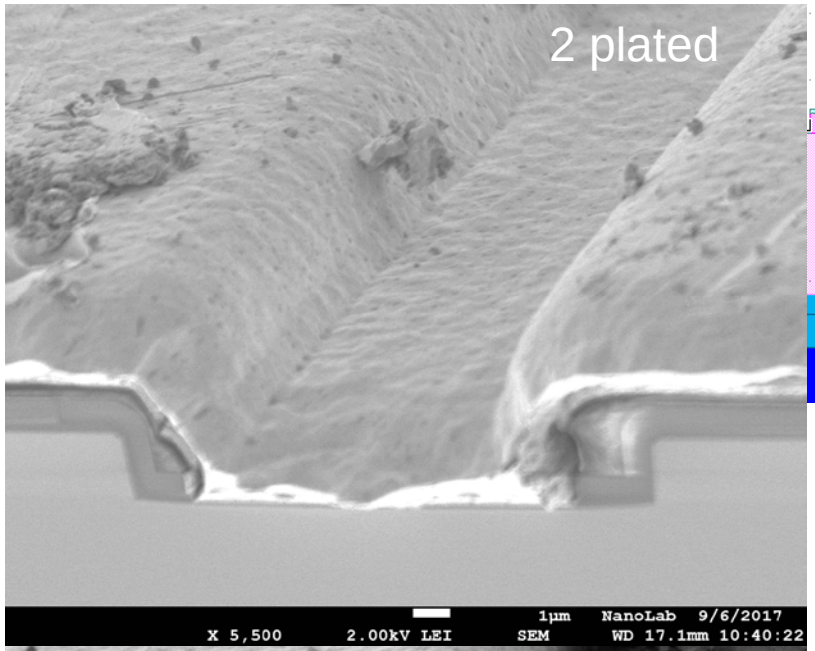


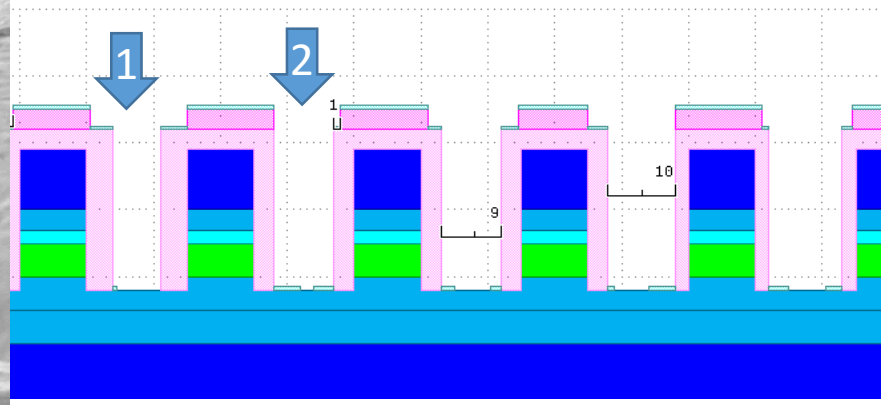
SP19 Results

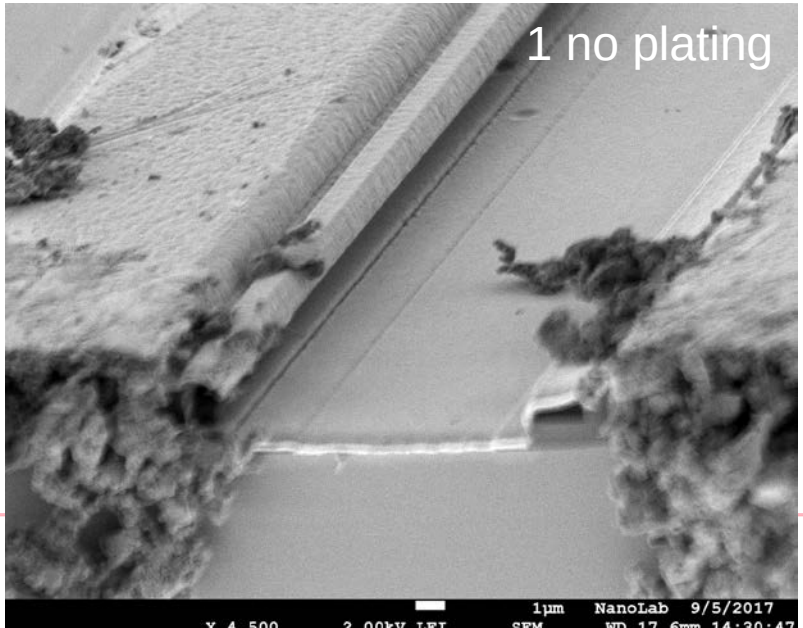


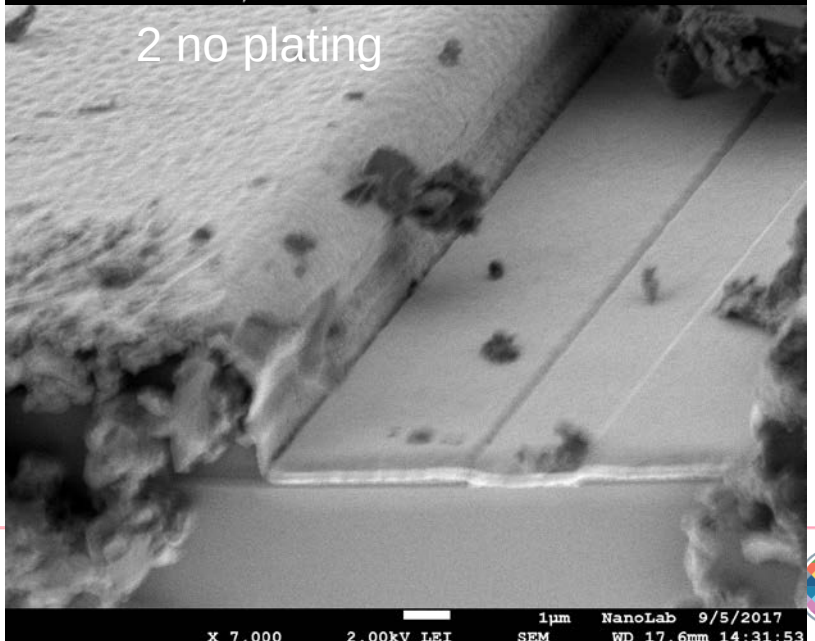
SP 19 Results











Electrical Measurements !

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