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# Contacting Nanowires

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## Progress Report

Christianne

22-11-2006

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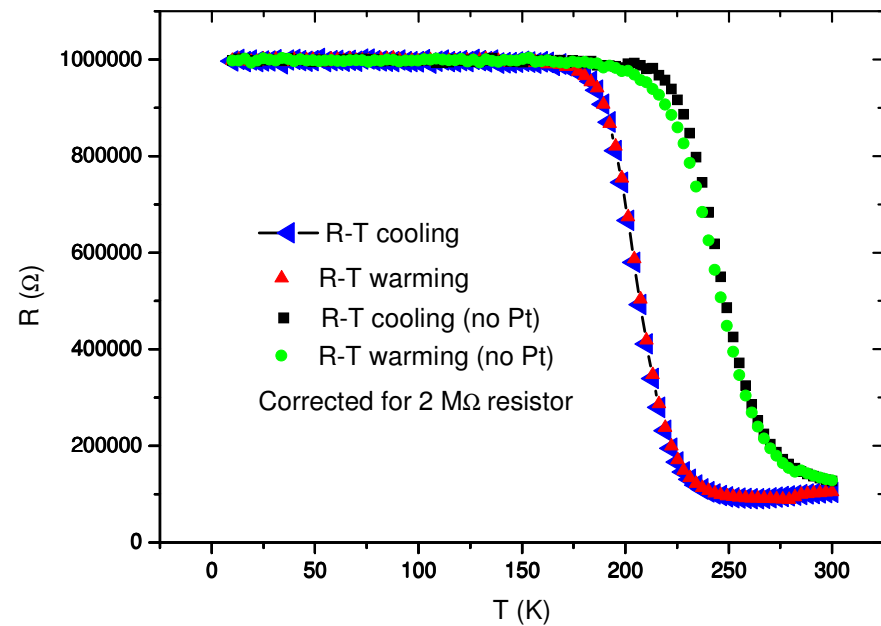
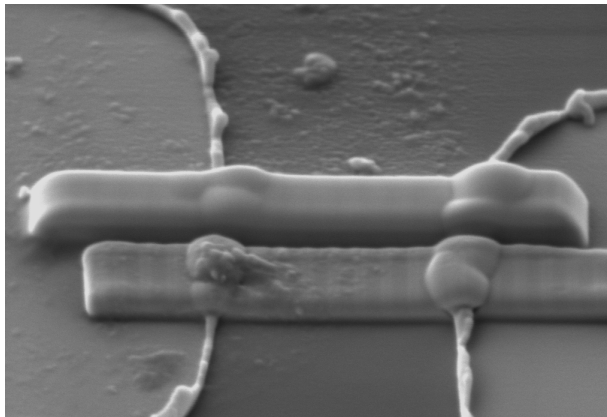
# Outline

- Before: EBID vs. EBPG
  - Results: sputtering
  - Recent results: evaporation
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# Quick Reminder

Why EBPG and not EBID?

Strip:  $t = 500 \text{ nm}$   
 $w = 800 \text{ nm}$   
 $l = 6.5 \mu\text{m}$

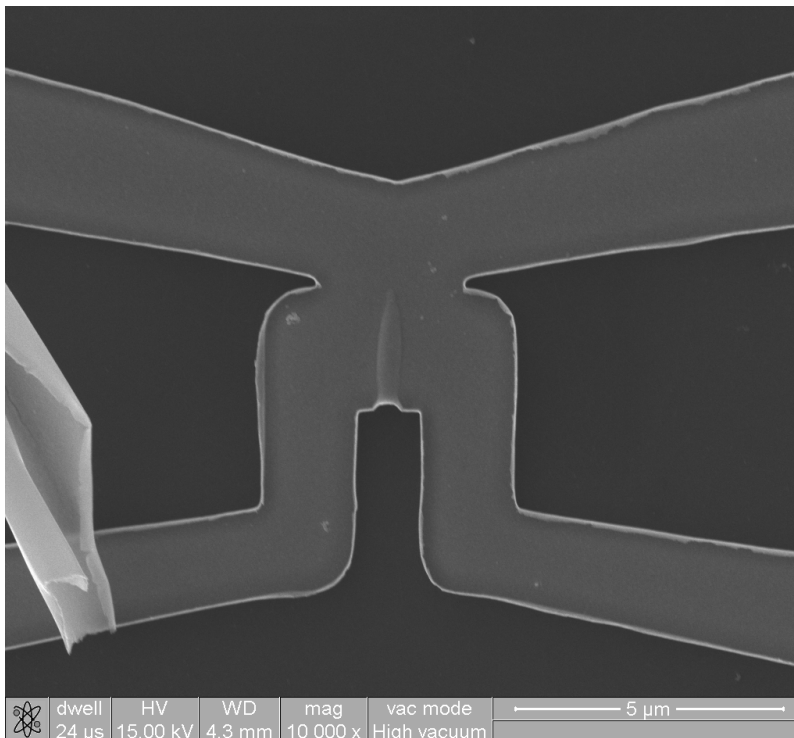
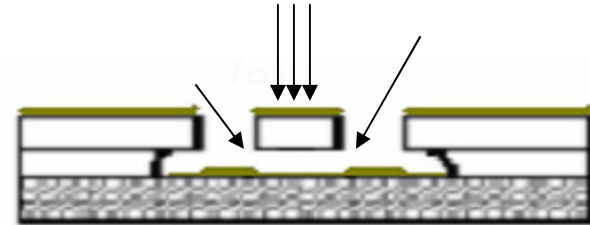


Low Pt concentration!

Use lift-off

# Results: Sputtering

Resist: bilayer PMMA-PMGI



Area Dose:  $160 \mu\text{As}/\text{cm}^2$

$I = 50 \text{ pA}$

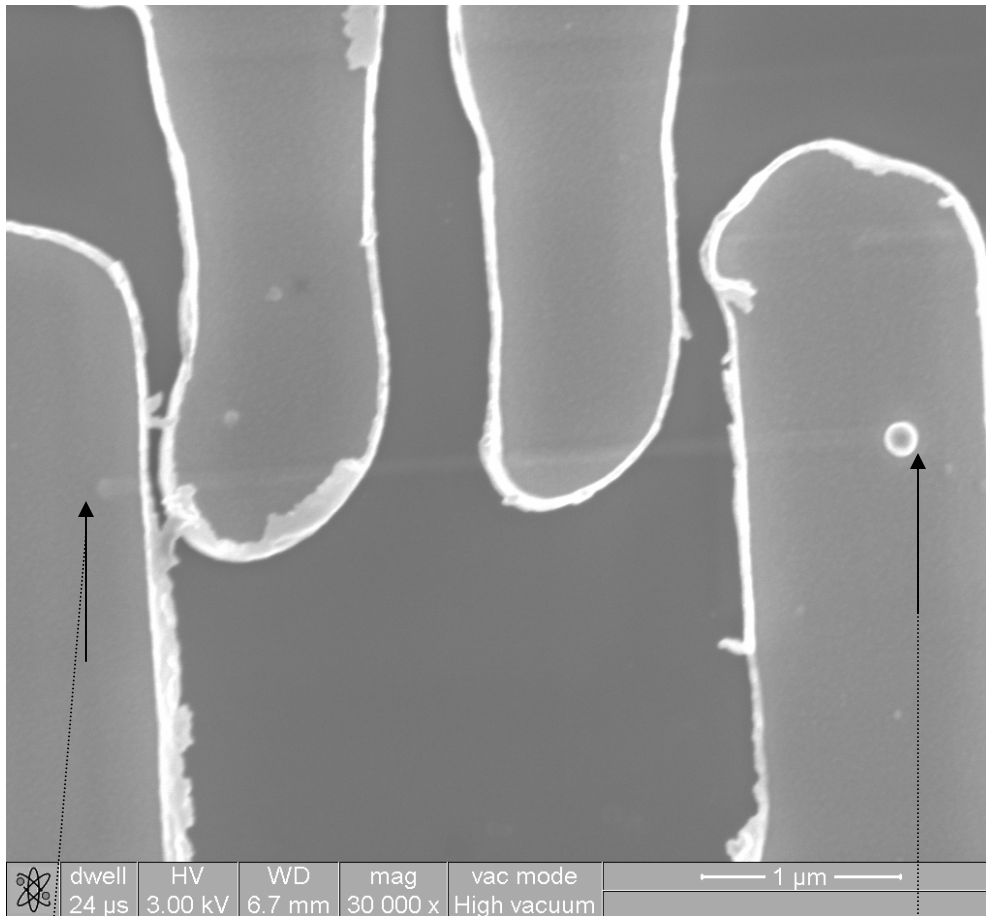
Dose factor: 2.3

Nominal sizes:

strip: 400 nm

spacing: 500 nm

# Results: sputtering



Pt strip:  $l = 4 \mu\text{m}$ ;  $w = 30 \text{ nm}$ ;  $t = 50 \text{ nm}$

Resist: bilayer PMMA-MMA

Area Dose:  $80 \mu\text{As}/\text{cm}^2$

$I = 50 \text{ pA}$

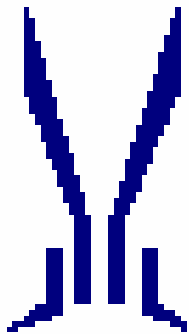
Dose factor: 1.5

“Ears”

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# Dose test: evaporation

Resist: single layer PMMA!!



Nominal sizes:  
strip: 200 nm  
spacing: 400 nm

Area Dose:  $80 \mu\text{As}/\text{cm}^2$

$I = 50 \text{ pA}$

Dose factor:  $1.0 \rightarrow 5.9$

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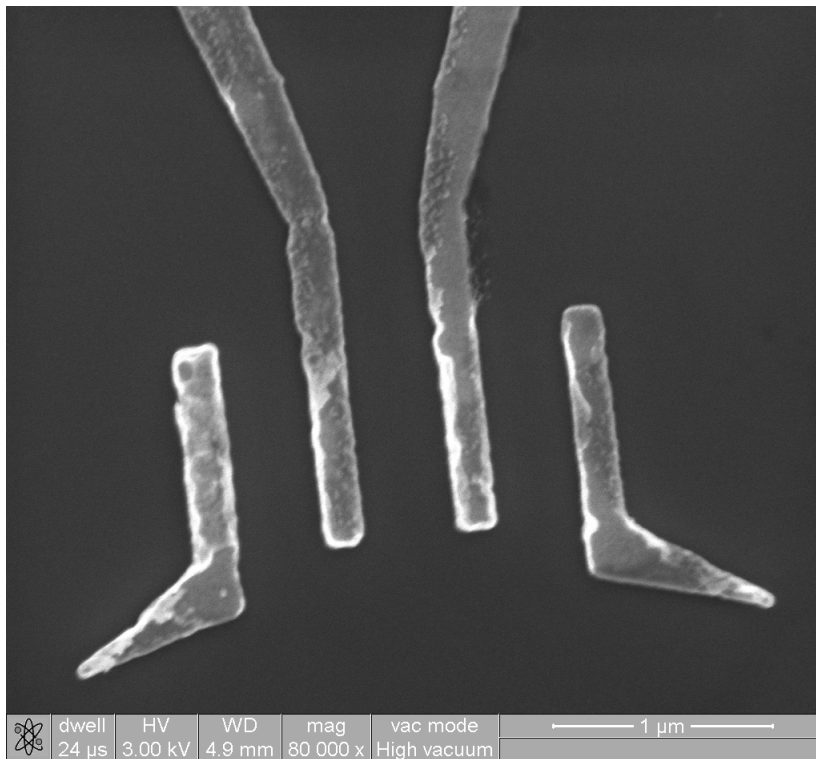
# Results evaporation

Dose factor: 1.3

Sizes:

strip: 175 nm

spacing: 415 nm

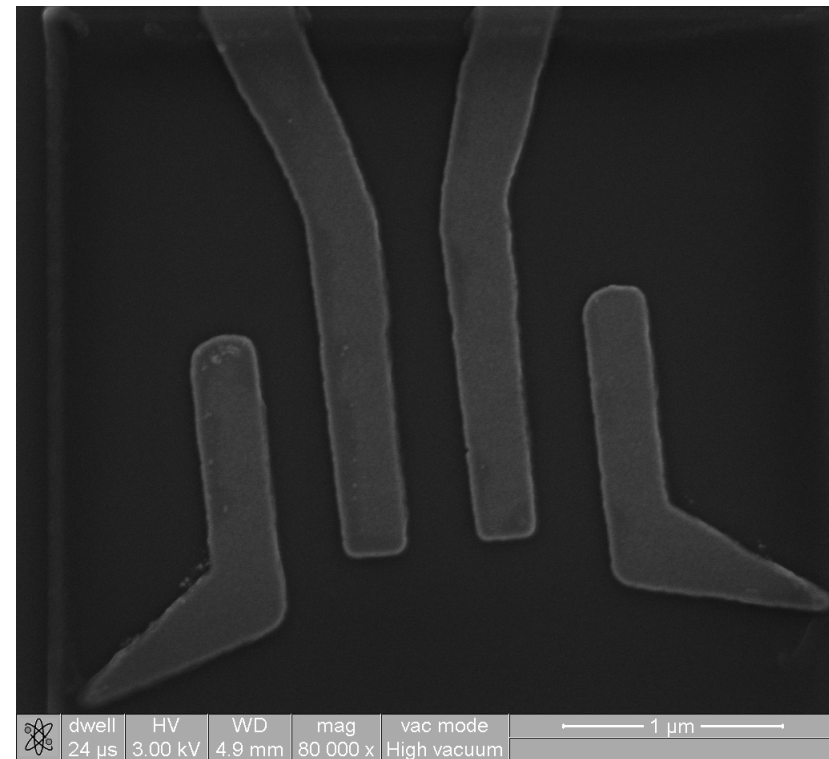


Dose factor: 5.9

Sizes:

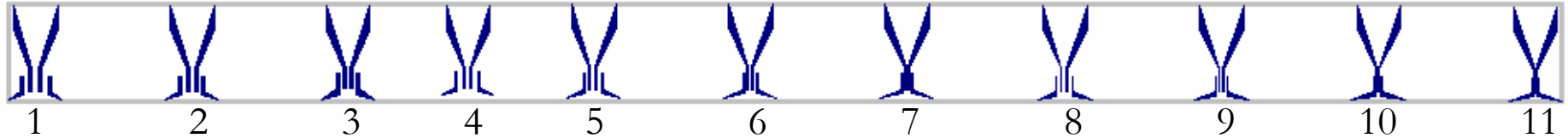
strip: 310 nm

spacing: 300 nm



# Dose test: evaporation

Resist: single layer PMMA!!



	Strip (nm):	Spacing (nm):
1	200	400
2	200	300
3	200	200
4	100	400
5	100	300
6	100	200
7	100	100
8	50	300
9	50	200
10	50	100
11	50	50

Area Dose:  $80 \mu\text{As}/\text{cm}^2$

$I = 50 \text{ pA}$

Dose factor:  $1.3 \rightarrow 4.1$



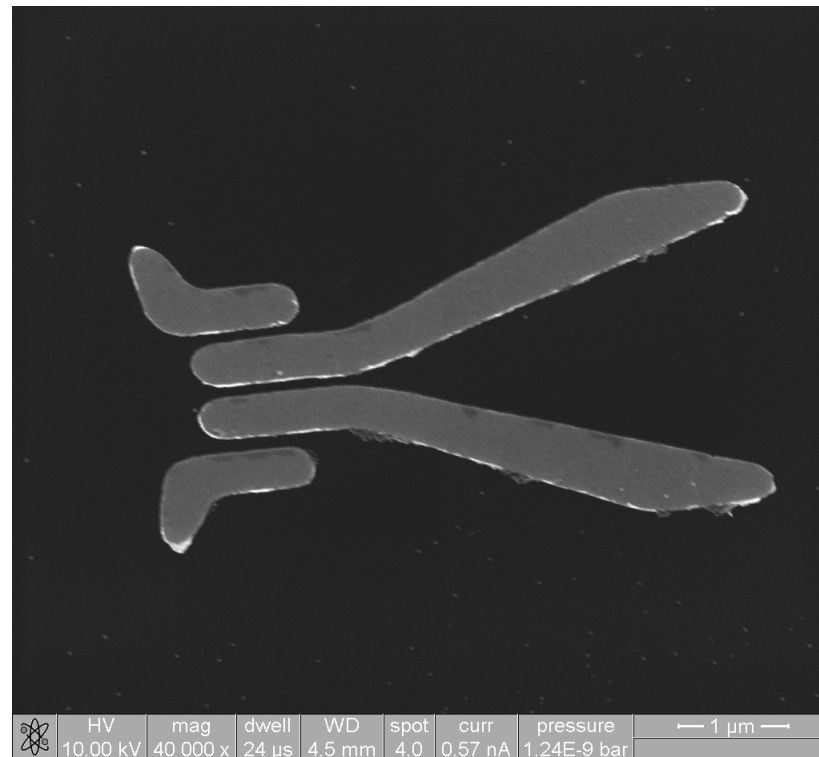
# Results: evaporation

Dose factor: 1.6

Sizes:

strip: 375 – 395 nm

spacing: 95 nm



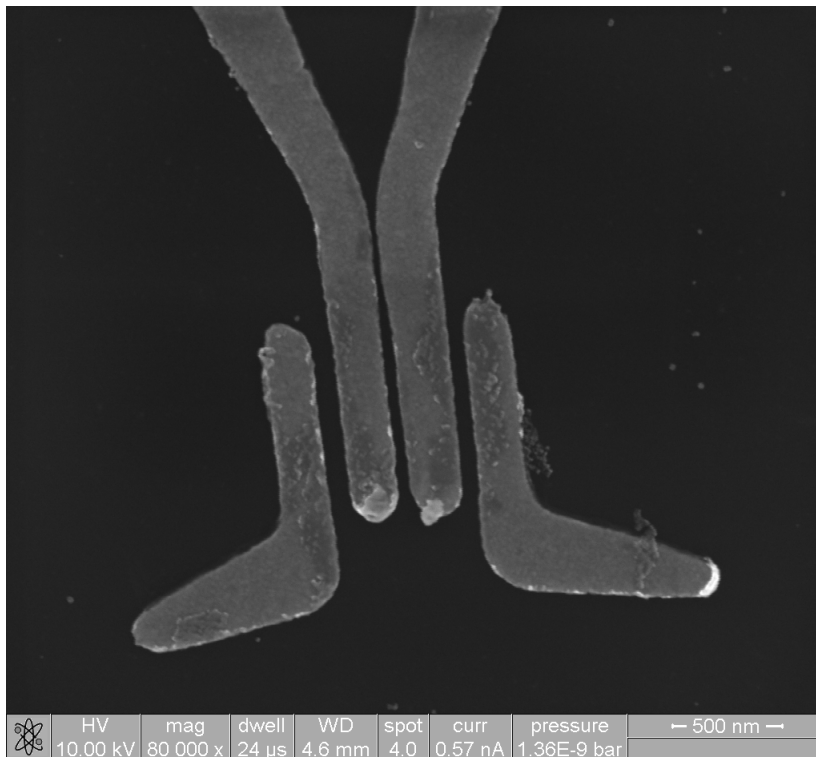
# Results: evaporation

Dose factor: 2.1

Sizes:

strip: 220 nm

spacing: 98 - 25 nm

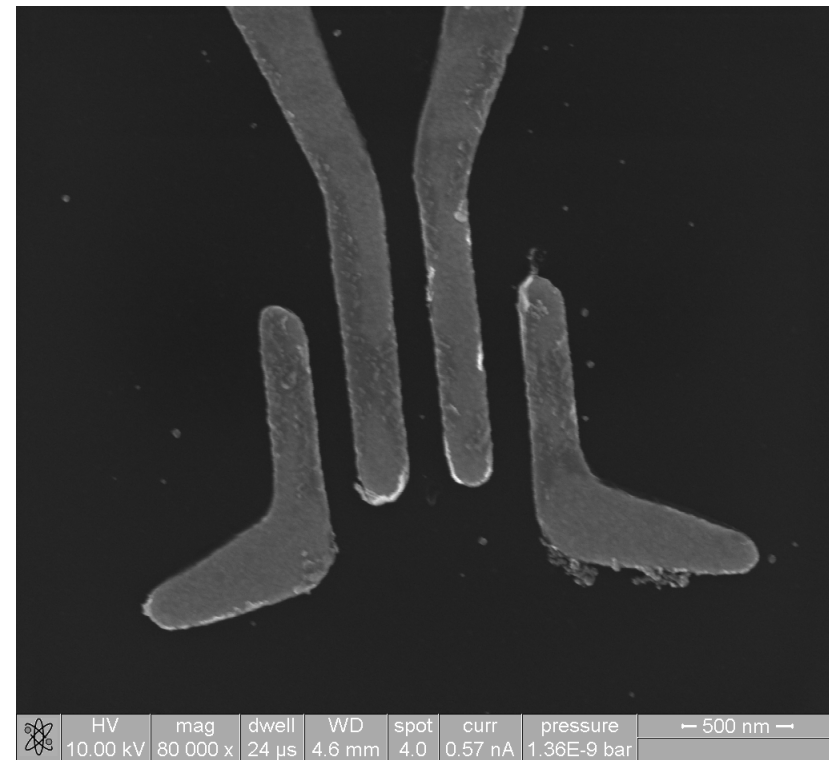


Dose factor: 2.1

Sizes:

strip: 220 nm

spacing: 157 nm



Total width: 1.39 μm

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# Conclusions

- Sputtering: nanowire longer than 3 - 4  $\mu\text{m}$ !
  - Evaporation: no ears, clean lift with single layer PMMA
  - Minimum nanowire length: 1.39  $\mu\text{m}$ !
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