Domaine / Field:	Date:	N° EDMS / EDMS Nr.:
Beam Instrument	30-8-2012	1239761
Requérant / Customer:	Liste de distribution / Distribution list:	
M. Sapinski (BE-BI)	M. Sapinski	

SEM observation along the C fibre and its tip morphology after the break in SPS

Données expérimentales / Experimental data:

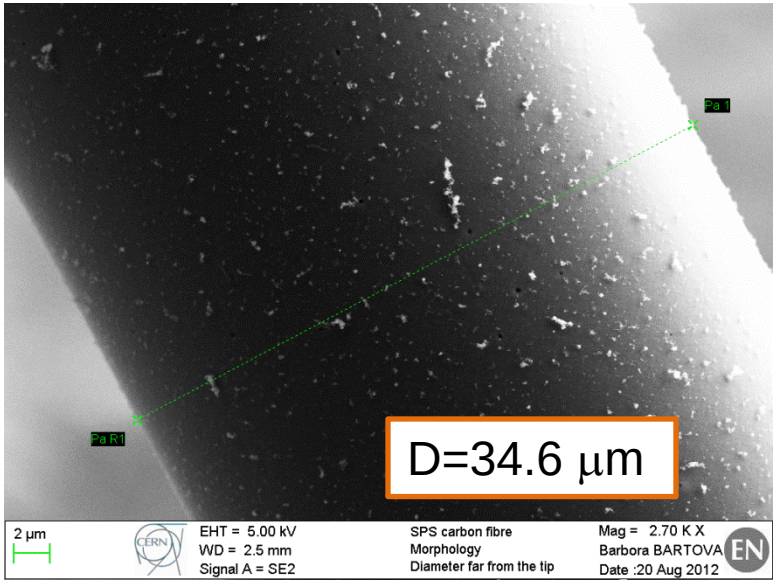
Samples : Sample of C wire broken in SPS

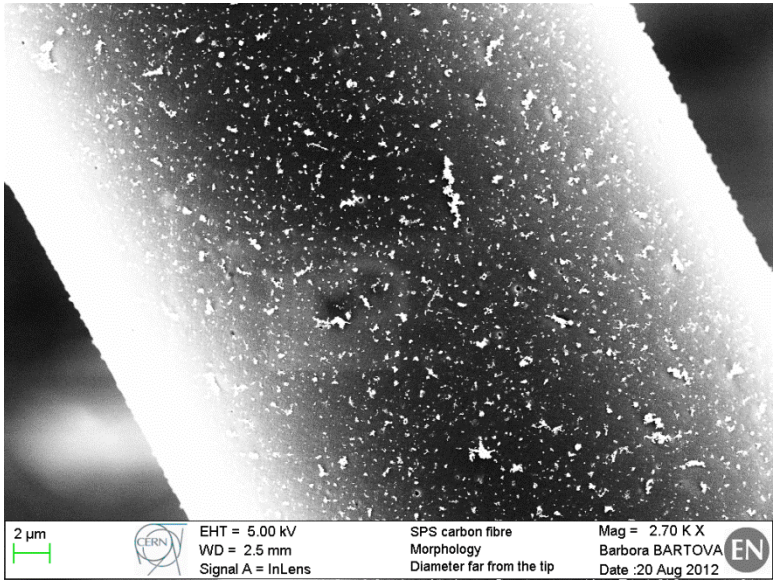
Parameters:
Observation along the wire and especially the tip for understanding the beam alignment procedure.

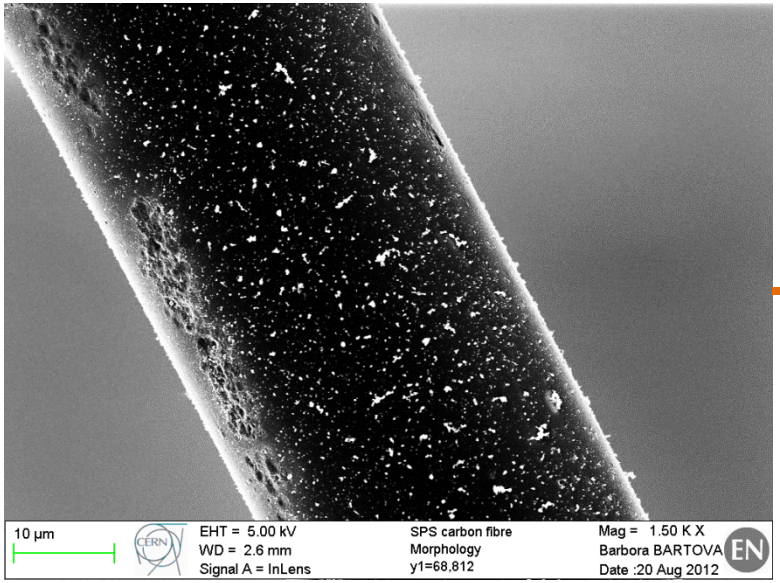
SEM ::Sigma ZEISS, SmartSEM software , X-MAX 50 mm2 SDD detector – Oxford instruments

Redaction / Written by: B. Bartova /EN/MME-MM	***Approuvé par / Accepted by:*** G. ARNAU IZQUIERDO/EN/MME-MM
Expériences / Testing by: B. Bartova /EN/MME-MM	***Superviseur / Supervisor:*** G. ARNAU IZQUIERDO/EN/MME-MM

Morphology of the wire not affected with the beam



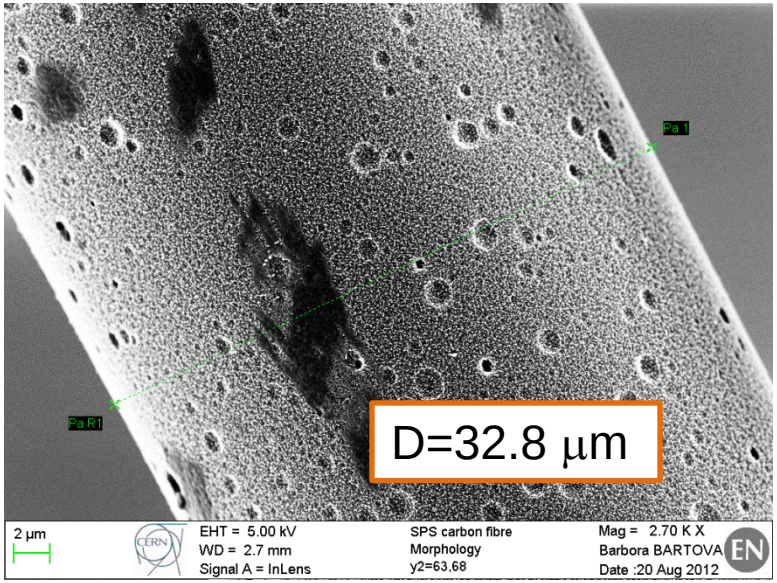


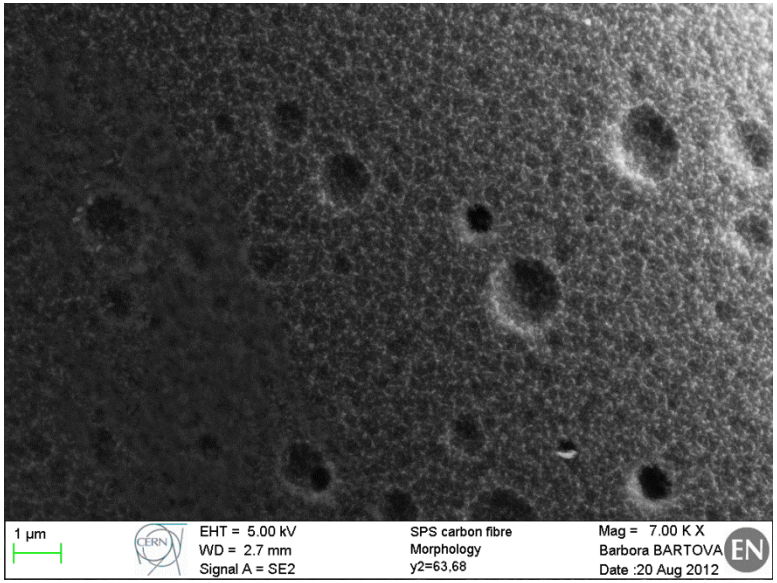


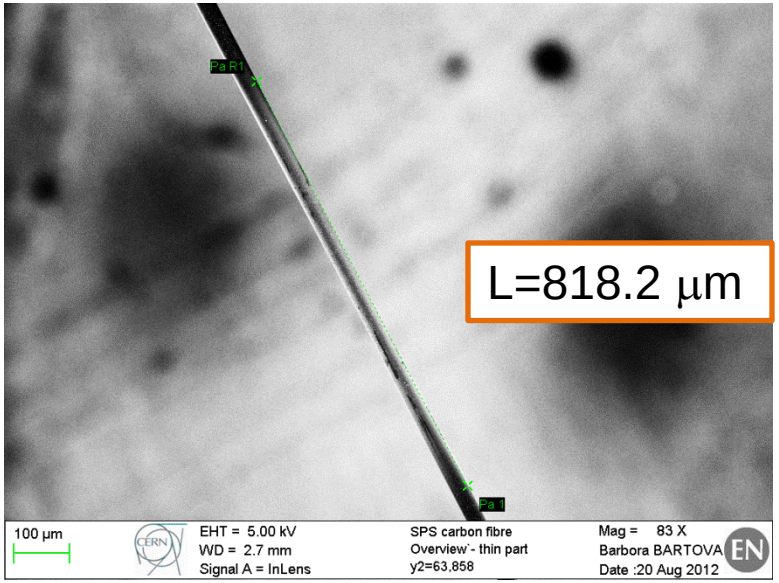
The diameter of non-damaged wire is about 34.6 microns.

Reference image with normal structure of C-wire. The goal was roughly estimate how far from the broken tip the damage could be found.

Morphology of the 1st area affected with the beam

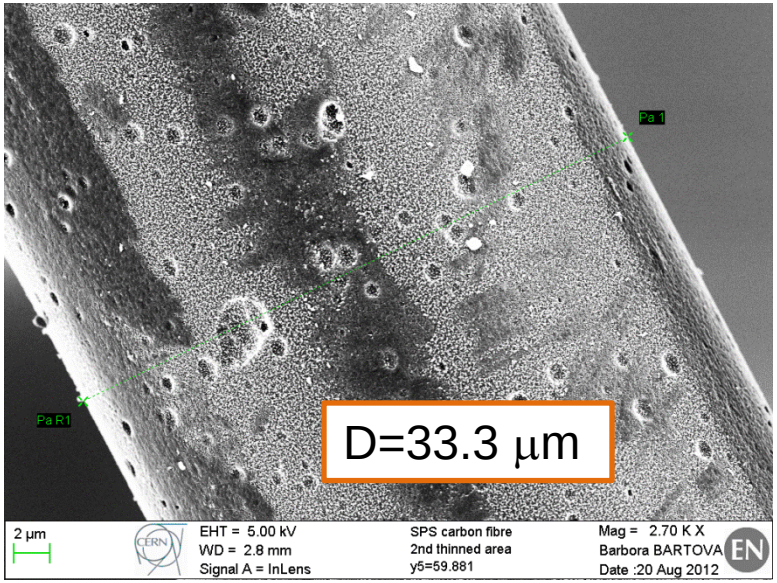


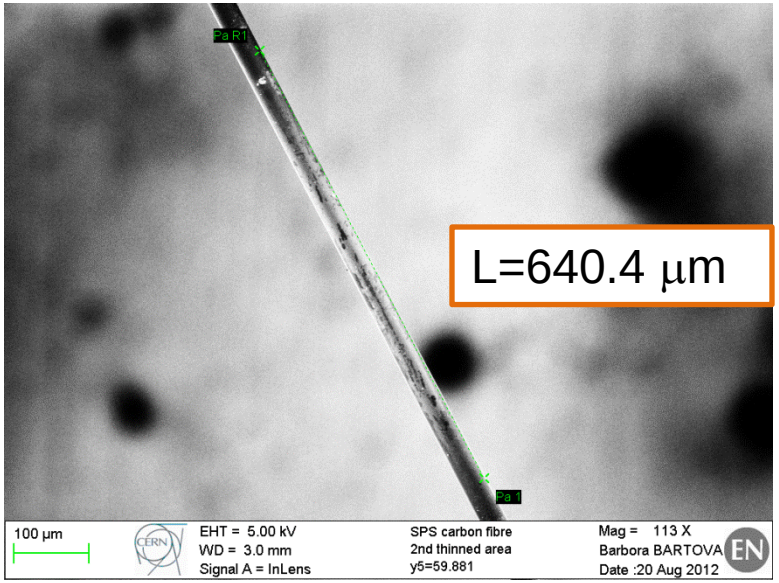




The diameter of 1st area of the wire affected with the beam from reference point is about 32.8 microns. The length is about 820 microns.
Small round hole were found on the surface of damaged area.

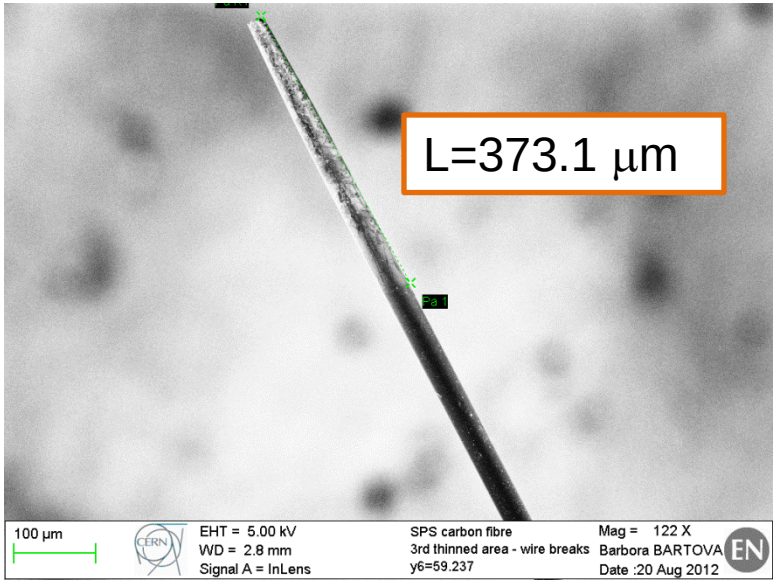
Morphology of the 2nd area affected with the beam

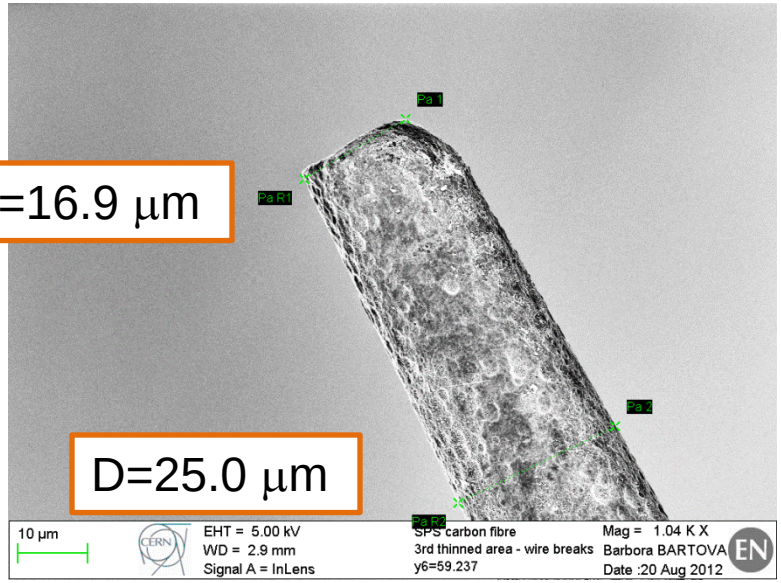


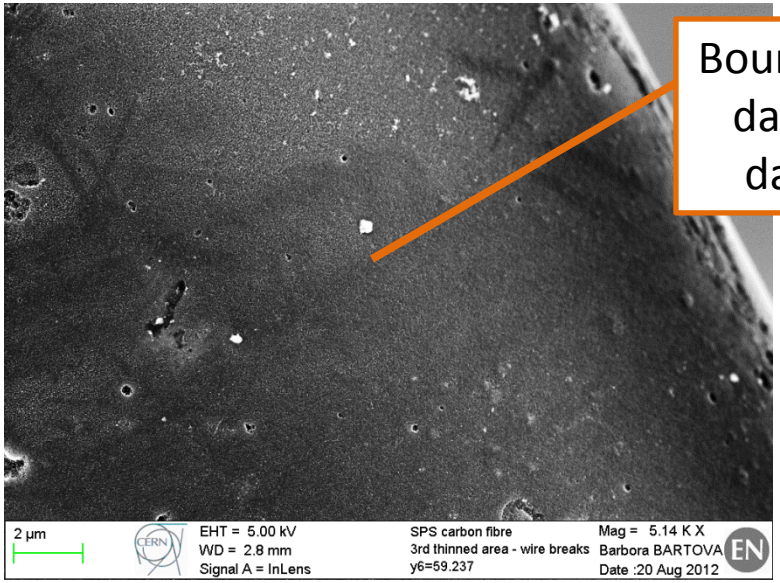


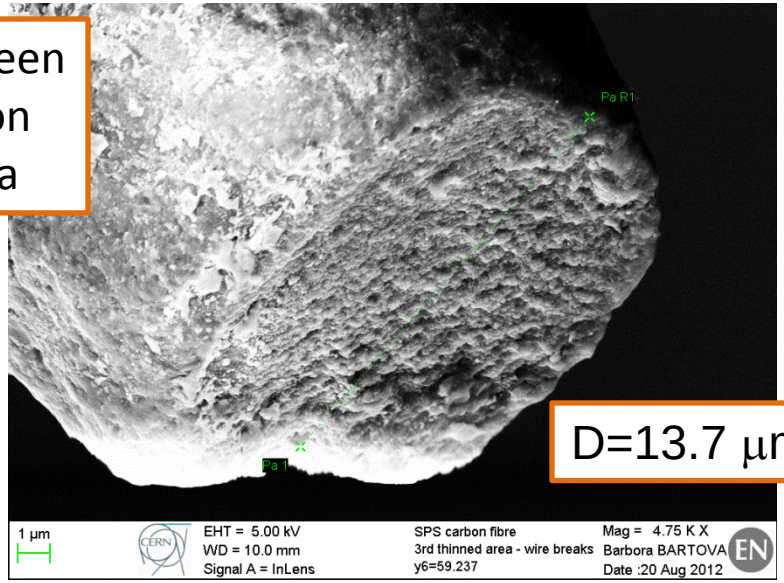
The diameter of 2nd area of the wire affected with the beam from reference point is about 33.3 microns. The length is about 640 microns.
Small round hole were found on the surface of damaged area.

Morphology of the 3rd area affected with the beam – wire breaks

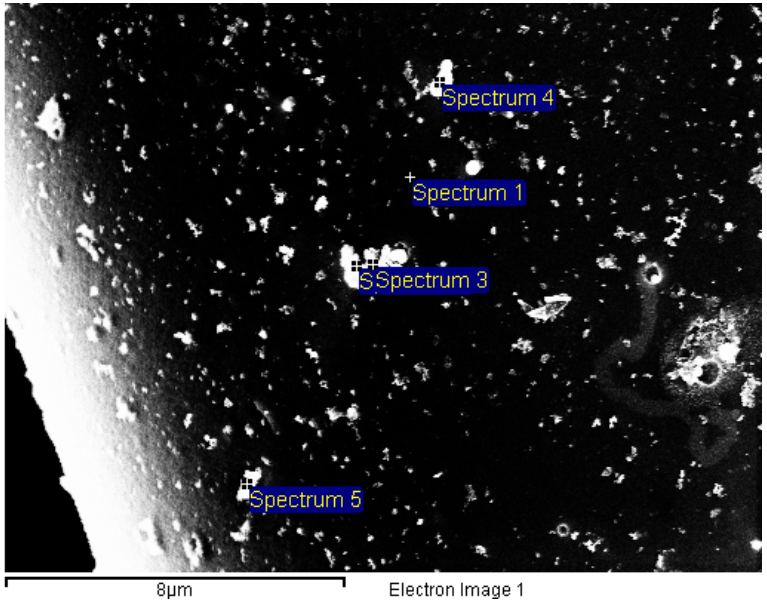






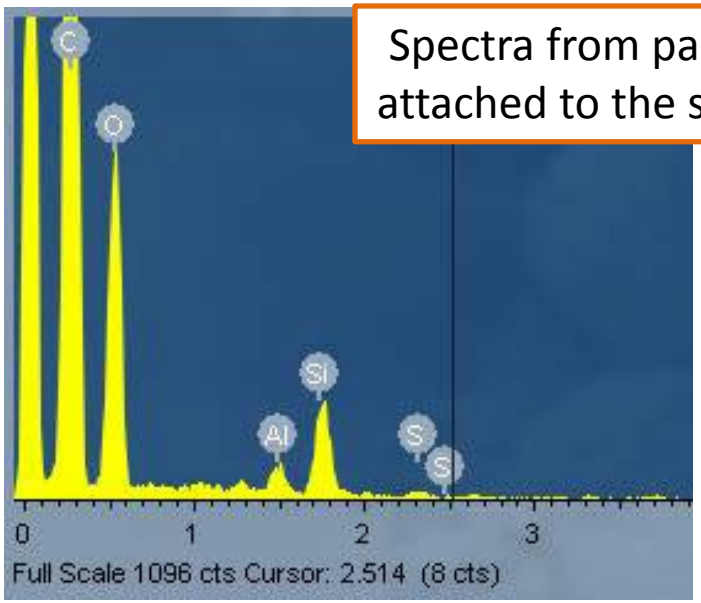


EDS analysis



Spectrum	In stats.	C	O	Al	Si
Spectrum 1	Yes	99.49	0.40	0.00	0.11
Spectrum 2	Yes	75.98	19.10	0.86	4.06
Spectrum 3	Yes	97.10	2.18	0.17	0.56
Spectrum 4	Yes	70.47	29.21	0.31	0.00
Spectrum 5	Yes	87.11	5.16	6.02	1.70
Mean		86.03	11.21	1.47	1.29
Std. deviation		12.73	12.46	2.56	1.69
Max.		99.49	29.21	6.02	4.06
Min.		70.47	0.40	0.00	0.00

Spectra from C wire



Spectra from particles attached to the surface

Conclusions

The tip of the C - wire broken in SPS was studied in detail. The cross section C – wire diameter is 13.7 microns almost 1/3 of original diameter of 34.6 microns. The morphology of the damaged areas shows holes on the surface and roughness. There are 2 other areas apart from the tip that were damaged, the first one is 644 microns far from the tip, the second one 4 mm far from the first one. Mentioned effect corresponds to the alignment of the beam during the experiment.
EDS analysis revealed that particles on the surface of the wire corresponds to mixture of C,Si,Al and O.