CERN — European Organization for Nuclear Research

EN-MME/MM

EN Engineering Department

Section de Matériaux et Métrologie/ *Materials and Metrology section*

Rapport expérimental / *Investigation report*

Domaine / Field:	***Date:***	***N° EDMS / EDMS Nr.:***
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Requérant / Customer:	***Liste de distribution / Distribution list:***	
M. G. Sapinski		

SEM observations of a Carbon wire (wire scanner)

1. Résumé / Abstract:

In the LHC, a 30 µm carbon wire is used to measure the beam profile in situ. After several months of use, the carbon wire has been dismounted and a reduced section area has been observed. It has been brought to the materials laboratory for SEM observations and to measure the section.

Previous similar observations can be found in EDMS report No. 696266 and BE technical note CERN-BE-2009-028 (http://cdsweb.cern.ch/record/1183415/files/CERN-BE-2009-028.pdf)

2. Données expérimentales / Experimental data:

Sample : 1 carbon wire (Ref : BWS.5L4.B2)

SEM : Leo 430i Leica, Leo software.

3. Résultats / Results (click on blue text to go to images):

An area where the section of the carbon wire is reduced has been located in the middle of the wire (Annex 1). The length of the affected area is approximately 1,5 mm.
The standard diameter of the carbon wire is 34 µm, by SEM we measure 33 µm (Annex 2).
In the reduced section of the wire we measure 17 µm of diameter (Annex 3).

4. Discussion et conclusions / Discussion and conclusion:

Calculations have predicted that the carbon wire would break after such exposition to the beam. Its diameter has been reduced to only half of the original.

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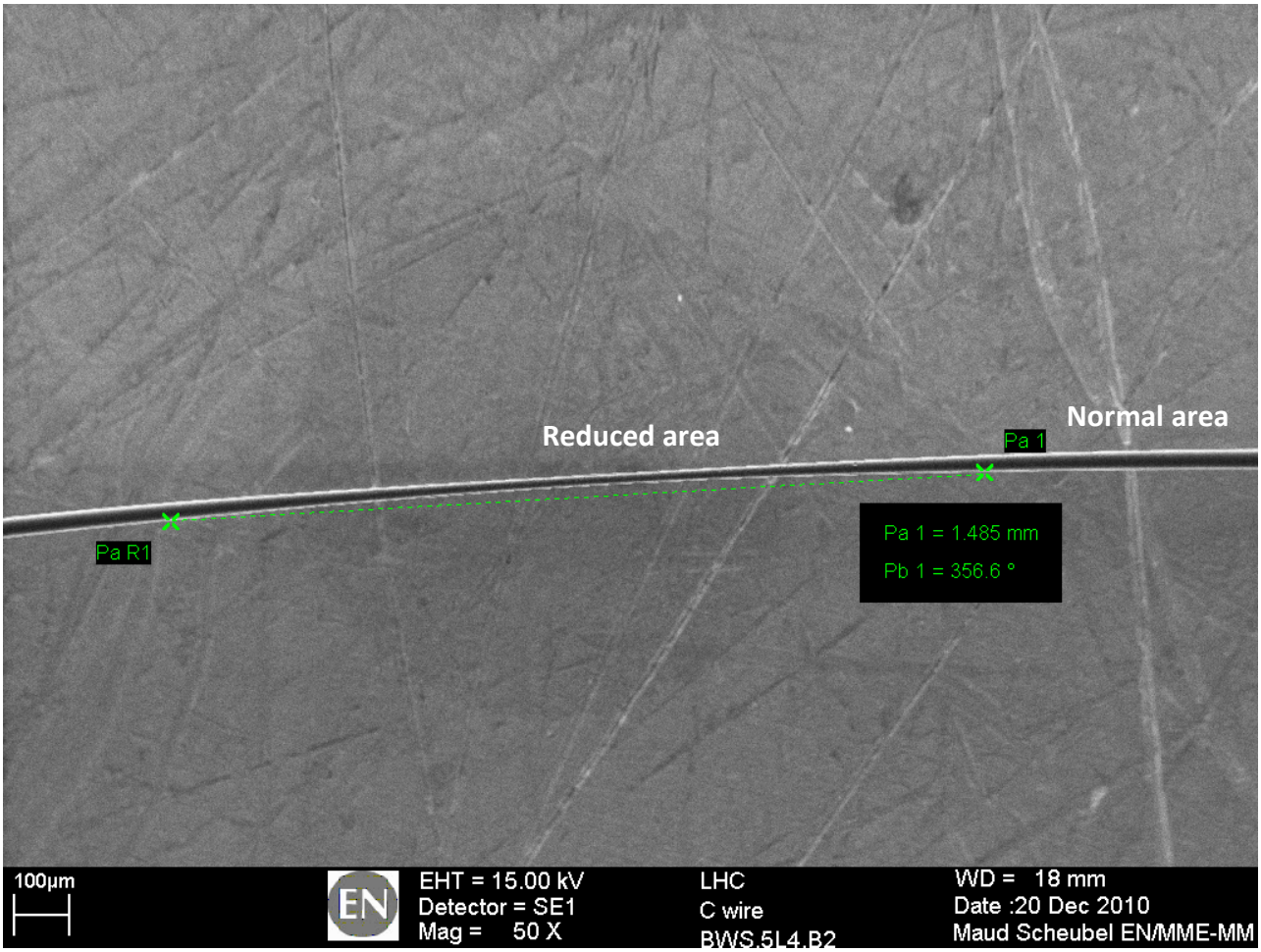
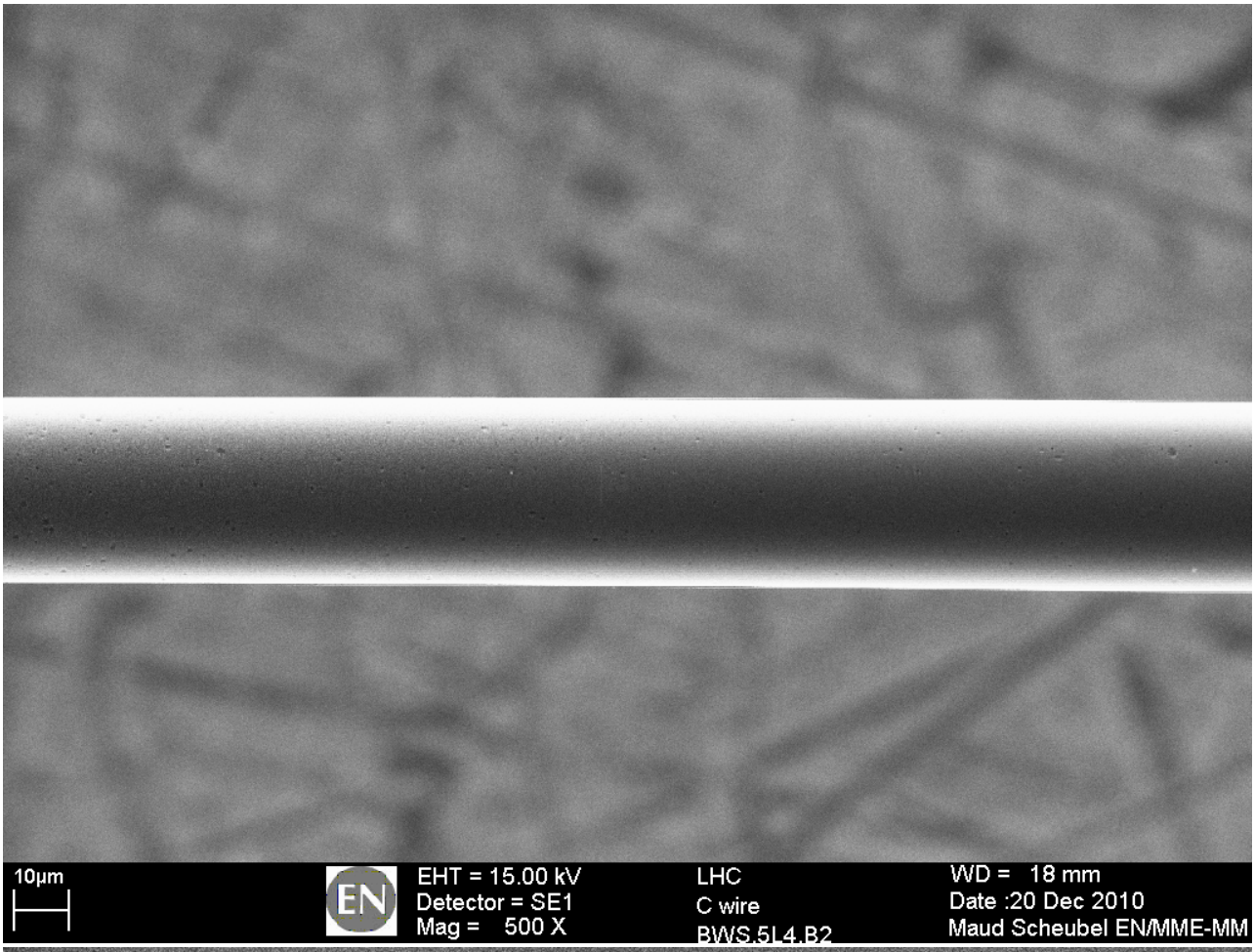
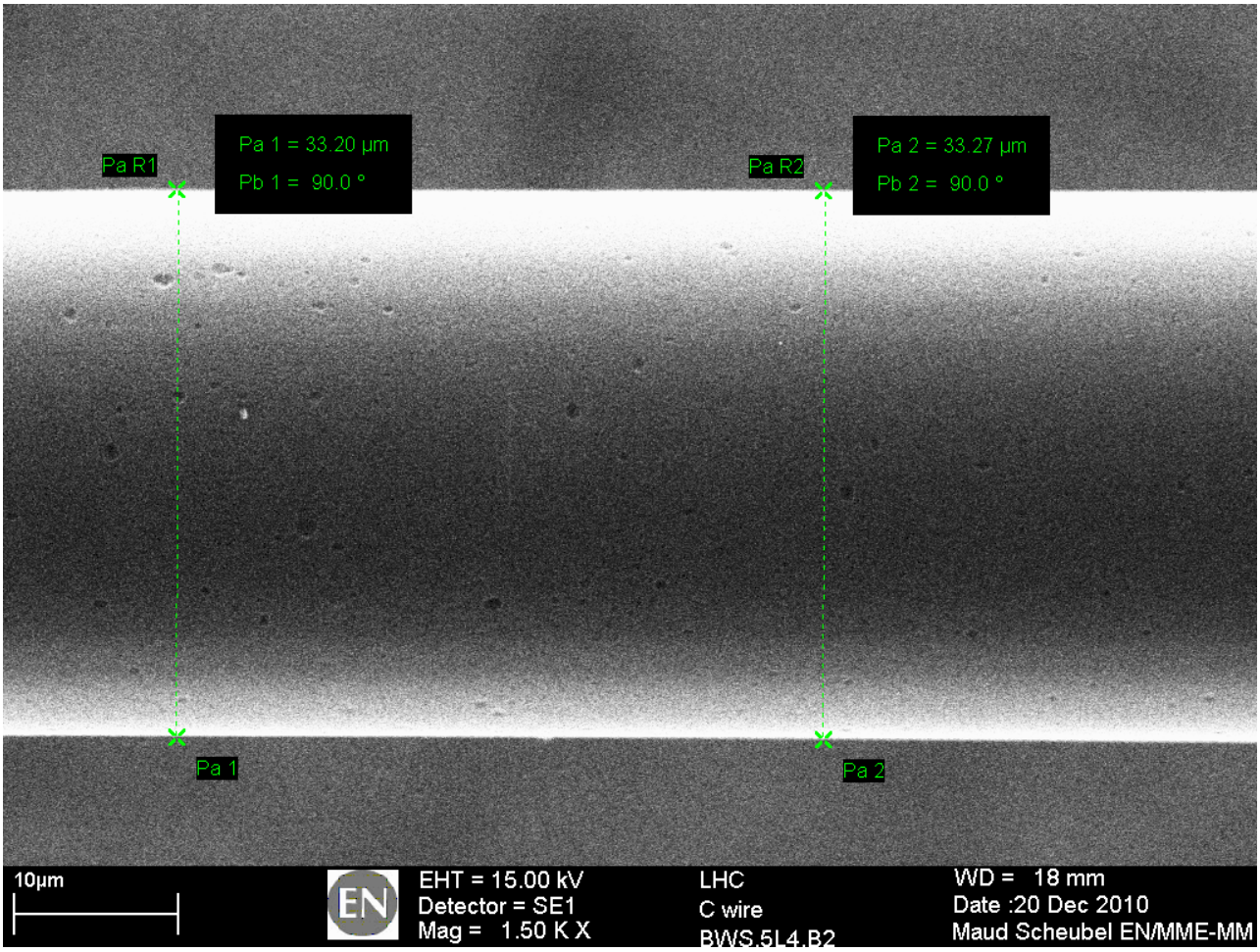
Annex 1: General view of the reduced are.



Annex 2: Normal area





Annex 3: Reduced area