

Selective laser processing of particle accelerator beam screen surfaces for electron cloud mitigation

Elena Bez,^{a,b} Ana Karen Reascos Portilla,^a Valentine Petit,^a Konstantinos Paraschou,^a
Lotta Methner,^a Kristóf Brunner,^a Patrick Krkotić,^a Yasemin Askar,^a Sergio Calatroni,^a
Mauro Taborelli,^a and Marcel Himmerlich^a

^a CERN, European Organization for Nuclear Research, 1211 Geneva 23, Switzerland

^b University of Leipzig, Linnéstraße 5, 04103 Leipzig, Germany

The supplementary information contains ASCII files of the data shown in the manuscript plots:

Fig. 3 – Electron density plots (4 files: *Fig3_a.txt*, *Fig3_b.txt*, *Fig3_c.txt*, *Fig3_d.txt*)

1st column: x coordinate in mm

2nd column: y coordinate in mm

3rd column: electron density ρ in m^{-3}

Fig4_profile.txt – Topography profile

1st column: y coordinate in m

2nd column: z coordinate in m

Fig4_map.txt – Topography map

1st column: x coordinate in m

2nd column: y coordinate in m

3rd column: z coordinate in m

Fig6.txt – Secondary Electron Yield

1st column: electron energy in eV

2nd column: SEY top corner (no unit)

3rd column: SEY bottom corner (no unit)

Fig7_main.txt – particulate density vs. SEY

1st column: SEY maximum (no unit)

2nd column: density of detached particles in cm^{-2}

Fig7_inset – Particulate density vs. diameter

1st column: equivalent circular diameter round in μm

2nd column: density of detached particles in cm^{-2}

Fig8_a.txt – SEY maximum during conditioning

1st column: 15 K – electron dose in C mm^{-2}

2nd column: 15 K – average of SEY (no unit)

3rd column: 15 K – error of SEY (no unit)

4th column: RT – electron dose in C mm^{-2}

5th column: RT – average of SEY (no unit)

6th column: RT – error of SEY (no unit)

Fig8_b.txt – SEY during conditioning

1st column: electron energy in eV

2nd column: RT – average of SEY at electron dose $2.3\text{E-}7 \text{ C mm}^{-2}$ (no unit)

3rd column: 15 K – average of SEY at electron dose $4.6\text{E-}7 \text{ C mm}^{-2}$ (no unit)

4th column: 15 K – average of SEY at electron dose $4.9\text{E-}4 \text{ C mm}^{-2}$ (no unit)

5th column: 15 K – average of SEY at electron dose $1.4\text{E-}2 \text{ C mm}^{-2}$ (no unit)

6th column: RT – average of SEY at electron dose $2.3\text{E-}7 \text{ C mm}^{-2}$ (no unit)

7th column: RT – average of SEY at electron dose $3.6\text{E-}4 \text{ C mm}^{-2}$ (no unit)

8th column: RT – average of SEY at electron dose $2.6\text{E-}2 \text{ C mm}^{-2}$ (no unit)

Fig. 9 – XPS spectra (4 files with doses indicated: Fig9_O1s_RT.txt , Fig9_O1s_15K.txt , Fig9_Cu2p_RT.txt , Fig9_Cu2p_15K.txt)

1st column: binding energy in eV

2nd column: normalised intensity (no unit)

***Fig9_conc.txt* – carbon surface concentration**

1st column: RT – electron dose in $C\ mm^{-2}$

2nd column: RT – Carbon atomic concentration in %

3rd column: 15 K – electron dose in $C\ mm^{-2}$

4th column: 15 K – Carbon atomic concentration in %

***Fig10.txt* – ratio of real part of the longitudinal beam impedance**

1st column: frequency in GHz

2nd column: ratio (no unit)

3rd column: lower Error (no unit)

4th column: upper Error (no unit)

***Fig11_left.txt* – map of normalized magnetic field strength distribution:**

1st column: x coordinate in m

2nd column: y coordinate in m

3rd column: normalised RF magnetic field strength (no unit)

***Fig11_right.txt* – angular dependence of normalized magnetic field strength at BS surface:**

1st column: angle phi in degrees

2nd column: normalised RF magnetic field strength (no unit)