Contribution ID: **199** Type: **not specified**

New LASE surfaces obtained with various lasers and their parameters for e-cloud mitigation

Tuesday 10 April 2018 18:01 (1 minute)

The vacuum chamber surface characteristics such as the photon and secondary electron yields (PEY and SEY) are critical for formation of an electron cloud, this is a serious problem that effects proton and positron accelerators. A few years ago it was discovered by us that Laser Ablation surface engineering (LASE) could provide surfaces with SEY<1. These LASE surfaces are the baseline design for the FCC electron cloud mitigation. However these surfaces should be better optimised for the FCC application: Surface resistance should be reduced to minimise the beam impedance in a LASE treated chamber, Pumping and desorption properties at cryogenic temperatures should be verified and the generation of particulates must be eradicated to avoid UFO problem in the beam chamber. In this talk we will report a number of new surfaces created using the LASE technique with different laser parameters (wavelength, scan speed, pitch, repetition rate, power, and pulse length) and their effect on the SEY, surface resistance and vacuum properties etc. of the surfaces created.

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Session Classification: Poster session

Track Classification: EuroCirCol