# Electron stimulated desorption studies on porous material used in next generation accelerators as cryogenic vacuum component

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For next generation accelerators, like LHC-HL, FCC-hh, EIC, etc., vacuum properties at cryogenic temperature represent a crucial aspect to be studied in order to assure best performances.

In all these future machines, the high current of the proton beams, with large number of short and high intensity bunches, may result in unacceptably high dynamic heat load of the cold beam pipes. To reduce this heat load, a beam screen with lower resistive-wall impedance needs be inserted. Such beam screen should grant low impedance to limit dynamic heat load to the cryogenic system and to avoid impedance-driven instabilities, but also to mitigate electron-cloud build-up and ensure adequate vacuum level and stability.

In this context, different beam screen surface treatments have been proposed, as amorphous Carbon film coating or laser ablation. Depending on the treatment, these surfaces show different degree of roughness, with a higher residual gas adsorption capacity compared to the otherwise bare and flat surface.

Also, during machine operation, these surfaces will undergo to thermal fluctuation, photon and electron irradiation. Then, a rigorous evaluation of their overall behavior in vacuum conditions is clearly required.

Here we report on our study about the effects induced by electron irradiation on a class of porous materials which are potential candidates of future accelerators. The results will be useful to predict the gas quantity delivered in cryogenic vacuum from porous surfaces.