

# Importance of the surface resistivity for the impedance model

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Transverse mode coupling instability (TMCI) can limit the maximum achievable bunch intensity in the FCC-hh. Impedance due to the resistive walls of the beamscreen makes a significant contribution to the TMCI, especially at the injection energy. The proposed laser treatment of the beamscreen surface for e-cloud mitigation might increase the impedance to a level unacceptable from the beam stability point of view.

We applied two models to estimate the impedance of a rough surface such as the one produced by the laser. Both models indicate that the TMCI intensity threshold due to the beamscreen alone can decrease by several times, placing serious limitations to the total area that can be treated without sacrificing beam stability. However, actual measurements of the impedance of the treated beamscreen are necessary to draw definite conclusions. We thus argue that such measurements are of critical importance for the FCC-hh.

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