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Update on R2E and heat load simulations

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At energies up to 50 TeV, understanding the impact of beam interactions with the residual gas along the vacuum chamber is essential during the design of the FCC-hh. Despite the ultra high vacuum (UHV) environment, secondary showers generated by such interactions produce a range of detrimental effects and place constraints on the maximum possible gas density.

A 214 m long FCC arc cell has been created in the Monte Carlo physics package FLUKA, based on the latest lattice configuration, beam screen and element designs. In this contribution simulations of beam-gas interactions, taking into account the most recent gas density distribution estimations, are presented. Building upon previous studies, an updated assessment of relevant quantities for the design of the lattice is provided, including dose, peak power density and total load on magnets. Additionally, in the scope of the R2E project, radiation levels in critical areas for the electronics have been ascertained and are discussed.

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