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RF feedback simulation for Diamond-II using ELEGANT

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The Diamond-II storage ring will utilise normal conducting main cavities and a passive superconducting harmonic cavity in its RF system. To evaluate the effects of bunch lengthening and lifetime gain from the harmonic cavity for different filling patterns, transient beam loading effects need to be studied. When simulating these effects with ELEGANT, RF feedback for the main cavities must be defined using sets of infinite impulse response (IIR) filters. This paper describes the method used to convert proportional-integral (PI) feedback parameters representative of the RF feedback implemented at Diamond into equivalent ELEGANT settings and presents simulation results demonstrating the effectiveness of the RF feedback. Transient beam loading effects for the standard and hybrid filling pattern are also studied.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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