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Transient beam loading and power analysis in the booster ring of CEPC

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During the injection phase of the Higgs mode of CEPC, the stored energy of the cavity is low and beam loading is relatively high. The synchrotron radiation damping is weak compared to the growth rate of the untidamped mode. This will cause two types of trouble. Firstly, the transient beam loading caused phase-shift between the head and the tail of the beam will be too much. Secondly, the untidamped mode will grow too fast. Therefore, we performed a series of studies in order to put a quantified requirement on the strength of the damping mechanism and the power overhead.

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Footnotes

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Yes

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