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Wakefield Calculations of the Undulator Section in FEL-I at the SHINE

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In free electron lasers (FEL) the accumulative effects of wakefields always lead to critical impacts on the electron bunch, resulting in an energy spread and deviation of transverse position. Thus the lasing performance will be decreased. The Shanghai high-repetition-rate XFEL and extreme light facility (SHINE) is under construction and the wakefields estimations are required. The SHINE contains three different undulator lines (FEL-I- III) designed for different functions. The wakefields of FEL-I undulator section has been studied in our work before. However the wakefields of inner segments between undulators are calculated simply. In this paper, we calculate the wakefields of inner segments considering more exquisite structures in FEL-I. We consider gradual changed connections between beam pipes of different diameters and dechirpers. We compared wakefields of different schemes of inner segments. Based on the results, we give some suggestions for the designation of the inner segments in FEL-I.

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