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Wakefield energy losses in the undulator section of the European XFEL

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The energy loss of the electron beam due to synchrotron radiation and wakefields determines an undulator tapering in order to keep the resonance condition along the undulator. The contribution of synchrotron radiation to energy loss can be calculated analytically, whereas the calculation of wakefield energy loss requires knowledge of the beam current profile and the wakefield function at the undulator section. We present an experimental method for accurate measurement of the energy loss due to wakefields in the undulator section for the European XFEL. We compare the results of the measurements with earlier developed analytical model of the wakefunction.

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Footnotes

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