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Studies of radiation background at the synchrotron light source DELTA

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The 1.5-GeV electron storage ring of the synchrotron radiation source DELTA at TU Dortmund University is surrounded by a 1 m thick concrete radiation shielding wall with a height varying between 3.0 and 4.3 m without the top being covered. The installation of a new 7-T superconducting wiggler and tentative plans for a new building in the vicinity motivated recent studies of background radiation either directly escaping the open-topped radiation shield or being scattered by air or the roof of the hall (the so-called radiation skyshine). Spectra of gamma radiation were recorded under different conditions using a high-purity germanium detector. Long-term measurements were made with photo- and thermoluminescence dosimeters. The paper presents the results together with calculations of the spectral distribution of wiggler radiation as well as a model for the spatial distribution of radiation emitted by the whole storage ring.

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Footnotes

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Yes

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