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Undulators for BESSY III

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HZB is in the process of developing a concept for a successor to the BESSY II synchrotron facility. The new facility will build on the strengths developed in Berlin over the last twenty years in delivering flexibly polarised soft X-Rays to dozens of beamlines. The successor facility BESSY III is planned to operate at 2.5GeV, in comparison to the 1.7GeV operation of BESSY II. This makes it easier to achieve the goal of delivering 1keV photons to beamlines on the first harmonic of our APPLE II Insertion Devices. It also makes it easier to achieve the aspiration of delivering tender X-Rays up to 10keV more routinely to users utilising in-vacuum APPLE II devices*, Cryogenic Permanent Magnet Undulators (CPMUs) or Cryogenic APPLE devices[2]. However, it also presents challenges in delivering the low energy photons below 10 eV, as period lengths of the relevant undulators must be increased, which in turn increases on-axis power. APPLE-KNOT designs will be pursued to overcome this issue.

The undulator group will also be planning Double Period Undulators[3] to offer beamlines broad spectrum coverage from 50eV to 10keV on the 1st and 3rd harmonics.

This paper outlines the first choices of undulators to be available to the successor facility BESSY III.

Funding Agency

Footnotes

[1]Bahrtdt, J. and Grimmer, S., "In-vacuum APPLE II undulator with force compensation", in Synchrotron Radiation Instrumentation - SRI2018, 2019, vol. 2054, no. 1. doi:10.1063/1.5084594.

[2] E. Rial et al., "Development of a cryogenic APPLE CPMUE15 at BESSY II in Synchrotron Radiation Instrumentation - SRI2021, in publication

[3]A. Meseck et al., "Triple Period Undulator", in Proc. IPAC'19, Melbourne, Australia, May 2019, pp. 1728-1731. doi:10.18429/JACoW-IPAC2019-TUPRB022

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