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Smart*Light: a high-brilliance ICS based x-ray source

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High-brilliance X-ray beams provided by large-scale synchrotron facilities allow detailed visualization of the structure of materials and tissues, making them indispensable for the development of new high-tech materials in the broadest sense of the word. Unfortunately, however, because of the size and costs of these big facilities they are scarce and not very accessible, with long waiting times for precious beamtime. Smart*Light is a lab scale x-ray source based on inverse Compton scattering and aims to bridge the gap between conventional lab x-ray sources and synchrotrons.

The Smart*Light beamline consist of a 100 kV DC photo-electron gun that creates 10 pC electron bunches which are accelerated up to 30 MeV using a high gradient X-band linear accelerator. The electrons interact with a 12 mJ, 800nm laser pulse to generate x-rays up to 20 keV. Alternatively the second harmonic of the laser pulse can be utilized to extend the x-ray energy up to 40 keV.

An overview of the design and results of the commissioning will be given.

Footnotes

Funding Agency

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