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Smart*Light: A high brilliance ICS X-ray Source

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At Eindhoven University of Technology a lab-based tabletop Inverse Compton Scattering (ICS) source is being commissioned. This compact and affordable X-ray source will bridge the gap between conventional lab X-ray sources and synchrotrons.

A 100 kV DC photo electron gun is used in combination with a bunching cavity to produce electron bunches that are injected in a X-band accelerator. The high gradient X-band accelerator is adapted from an original design for the Compact Linear Collider (CLIC). The accelerated electron bunches are focused and collide with a focused 12 mJ/pulse 800 nm laser beam thereby producing X-ray photons with energies between 10 and 40 keV. The physical basis behind the production of the X-rays is the ICS process in which photons from the laser pulse are bounced off a relativistic electron bunch, turning them into X-ray photons through the relativistic Doppler effect.

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

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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