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Status of beam commissioning at NanoTerasu

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NanoTerasu is a new 3 GeV compact soft X-ray (SX) light source having a circumference of 349 m constructed in Japan. The lattice structure is a type of multi-bend achromat with design emittance values of 1.14 nm·rad and 10 pm·rad, respectively. A target stored current is set to 400 mA to provide a high coherence and highly brilliant light from extreme ultraviolet to SX range. The injector LINAC commissioning was started in April 2023. After first 10 days, the beam energy successfully reached 3 GeV with the designed emittance. The 3 GeV C-band full-energy injector LINAC enables the extension to the SX free electron laser in the future. The storage ring beam commissioning was started on June 8th. We achieved the off-axis beam injection just adjusting beam injection trajectory from the beginning of the beam commissioning. As a result of the precise alignment of the magnets, the injected beam turned around 300 turns without the supply of RF power and the adjustment of the steering magnets on the first day of the commissioning. The stored current was reached 300 mA with top-up beam injection in November. The user operation will be started in April 2024. The creation of COD and tune correction tables for the insertion device is also in progress including non-linear magnetic field correction. We try to start the user operation with designed 400 mA top-up beam injection. The status of beam commissioning will be presented.

Footnotes

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