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The recent status of High Energy Photon Source (HEPS)

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One of the important tendencies in the development of synchrotron radiation sources is low emittance. Low emittance storage rings could provide higher brilliance and better coherence, which are very important for almost all kinds of experiments in synchrotron radiation facilities. The 4th generation synchrotron radiation facilities can provide 2 or 3 orders of higher brilliance and coherence comparing with 3rd generation ones. In the meantime, the successful construction of Shanghai Synchrotron Radiation Facility and the great achievements in the research in this facility, inspire the users to build the new and high-performance light sources in China. In the view point of regional factors, the vast in territory of China requires the reasonable distribution of synchrotron radiation facilities which support the scientific and technological research, in order to farthest satisfy the demands of users from different regions.

Based on the above reasons, we are building a new synchrotron radiation facility in the region around Beijing: High Energy Photon Source (HEPS). The designed electron energy of HEPS is 6GeV and the emittance is lower than 0.1nmrad. This machine can provide the hard X-ray with brilliance higher than 10^{22} ph/s/mm²/mrad²/0.1%BW and photon energy higher than 300keV.

The construction of HEPS started in June 2019, including a 500MeV LINAC, a 6GeV booster, a 1360m-circumference storage ring, 14 public beamlines and 1 test optical beamline, as well as the auxiliary facilities and building. Before the start-up of HEPS, the R&D project (HEPS-TF) was supported during 2016-2019. The Platform for Advanced Photon Source (PAPS) was supported in 2017 in order to provide a field for technology research and the assembling of the instruments of HEPS.

The installation of LINAC started in March 2022, commissioning in March 2023. In June 2023, the electron energy of LINAC reached to 500MeV, and the bunch charge reached to 7nC.

The installation of booster started in August 2022, commissioning in July 2023. By 4 months of debugging, the electron energy reached to 6GeV and bunch charge to 5nC, in November 2023.

The installation of storage ring started in February 2023. Now all the magnets and girders are ready. The commissioning is planned in July 2024.

All the FOEs and hutches of beamlines are ready. The instruments of beamlines and end-stations are in installation. The commissioning of beamlines will start with storage ring.

In the meantime, the teams of beamlines and end-stations cooperate with users, to plan the day-one experiments and the construction of future beamlines. Several jointed research centers and laboratories are established to solve the problems of industries and explore the application of the unique experimental methods of 4th generation synchrotron radiation in frontier researches. We hope the users of HEPS can launch intensive research, instead of simple measurements in future. In order to support this purpose, the office & laboratory building as well as guesthouse, were completed.

The whole facility will be in operating at the end of 2025.

I plan to submit also conference proceedings

Yes

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