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Results of the NSLS-II commissioning

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The National Synchrotron Light Source II at Brookhaven National Lab is a third-generation synchrotron radiation facility that has been commissioned in 2014. The facility is based on a 3 GeV electron storage ring, which will circulate 500 mA of beam current at 1 nm rad of horizontal emittance. The storage ring is 792 meters in circumference and will accommodate more than 60 beamlines in the final built-out. The beamline sources range from insertion-devices located in straight sections, bending magnets or three-pole-wigglers configured in multiple branches. The linac commissioning activities started in March of 2012 and was accomplished in several weeks. In Dec. 2013 the booster commissioning commenced and reached its goal in February 2014. The commissioning of the NSLS-II storage ring was successfully completed in July 2014, taking about two months in total. The storage ring is now operating at 50 mA with 3 sets of Damping Wigglers resulting in 1 nm rad of horizontal emittance. We delivered the first user light on October 23, 2014. At this point six NSLS-II project beamlines are routinely taking photons since November of 2014. In this presentation I review the NSLS-II accelerator design and our experience with getting ready for the machine start-up. In the following I focus on the commissioning results and present details, issues and advances in reaching the commissioning milestones.

In collaboration with Timur Shaftan and Ferdinand Willeke, Brookhaven National Laboratory.