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Verification of SPring-8-II vacuum system prototype chamber

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The SPring-8-II project, upgrading SPring-8 to a 4th generation light source, started in FY2024. SPring-8 will shut down after summer 2027 for removal of existing equipment and installation of new accelerator components. User operation is scheduled to resume in spring 2029. The project requires a vacuum system compatible with compact, reduced-aperture magnets, ensuring sufficient beam lifetime and operational flexibility. An efficient pumping system was introduced for lifetime assurance, localizing photon-stimulated desorption gas near distributed absorbers and utilizing closely placed NEG pumps. A low coupling impedance vacuum system was designed by optimizing chamber geometry etc. to enable various operation modes. Prior to the mass production of vacuum components, prototypes of the main vacuum chambers were fabricated and their performance was verified with magnet arrays. These tests confirmed procedures for rapid installation and vacuum commissioning excluding in-situ baking after installation, checked for interference with other equipment, and verified vacuum performance. We present the design progress and prototype verification results for the SPring-8-II vacuum system.

Footnotes

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Author: Dr TAMURA, Kazuhiro (Japan Synchrotron Radiation Research Institute)

Co-authors: DEWA, Hideki (Japan Synchrotron Radiation Research Institute); Dr MASAKI, Mitsuhiro (Japan Synchrotron Radiation Research Institute); MASUDA, Takemasa (Japan Synchrotron Radiation Research Institute); Mr OISHI, Masaya (Japan Synchrotron Radiation Research Institute); OTA, Hiroshi (Japan Synchrotron Radiation Research Institute); Dr SHOJI, Masazumi (Japan Synchrotron Radiation Research Institute); TAKANO, Shiro (Japan Synchrotron Radiation Research Institute); Ms TANIUCHI, Yukiko (Japan Synchrotron Radiation Research Institute); UEDA, Yosuke (Japan Synchrotron Radiation Research Institute); WATANABE, Takahiro (Japan Synchrotron Radiation Research Institute)

Presenter: Dr TAMURA, Kazuhiro (Japan Synchrotron Radiation Research Institute)

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