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Commissioning of the APS-Upgrade storage ring vacuum system

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The APS-Upgrade Project (APS-U) built a new electron 1100 meter circumference storage ring within the original APS tunnel. APS-U's new storage ring vacuum system is a complex assembly of over 2500 custom vacuum chambers. The vacuum pumping system is a hybrid combination of NEG-coated vacuum chambers, ion pumps, and uncoated chambers with NEG strip pumping. APS-U began operations in April 2024 and by early 2025 has successfully commissioned the vacuum system to achieve low UHV operating pressures which helped the machine reach key performance parameters and allows for reliable delivery of beam to the users with minimal downtime. The commissioning performance of the machine indicates the NEG coated chambers are performing reliably even with a relatively minimal bakeout and activation. This presentation will share results and analysis of the vacuum system commissioning and performance along with lessons learned from the installation and operations phases.

Footnotes

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