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Vacuum system design and prototyping for the ALBA II upgrade

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ALBA is working on the ALBA II upgrade to transform the current storage ring, in operation since 2012, into a 4th-generation diffraction-limited synchrotron light source. The vacuum system is designed for a compact geometry with tight magnet apertures, where synchrotron power is distributed directly onto the chamber walls. Nevertheless, crotch absorbers will be used at key locations. Due to the low conductivity in such small chambers, the entire ring will be NEG coated to accelerate vacuum conditioning and achieve the required ultimate pressure. Most of the vacuum chambers of the 268.8 m long ring, divided into 16 arcs of 12.8 m each, will be made of OFHC-Cu or CuCrZr to dissipate synchrotron radiation and reduce resistive wall impedance. The chambers will have a nominal internal diameter of 16 mm, a minimum wall thickness of 1 mm, and clearances of up to 0.5 mm from magnet poles. Launched in 2021, the upgrade includes an R&D program focused on prototyping critical components. This contribution presents the overall vacuum system status, the design and production of vacuum prototypes, and initial component tests.

Footnotes

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