



Contribution ID: 2255 Contribution code: THPA136

Type: **Poster Presentation**

Elettra 2.0: the vacuum system design for a new generation storage ring

Thursday 11 May 2023 16:30 (2 hours)

At Elettra-Sincrotrone Trieste (Italy), the Elettra 2.0 project aims to develop a new-generation storage ring. Taking into consideration the numerous constraints, we decided to adopt a new design of a vacuum chamber, while utilizing novel pumping solutions to overcome hugely reduced conductance compared to the current machine. Large sputter ion pumps (SIP) will be in majority replaced by distributed non-evaporable getter (NEG) coatings and small NEG cartridges and SIP pumps. For the synchrotron radiation handling, due to the tight space constraints imposed by the compact lattice, the photon absorption will be managed jointly with discrete and distributed solutions: photon absorbers have been carefully studied for combining compact form and high power density loads, while key sections of the new storage ring will be water-cooled. Throughout the whole development phase, we were using Monte-Carlo simulation codes like SynRad and MolFlow+ as effective tools supporting the design of new vacuum chambers and photon absorbers.

The current state of development for the Elettra 2.0 vacuum system, the challenges that we faced and the solutions that we adopted are here presented.

Funding Agency

Footnotes

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Yes

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Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T14: Vacuum Technology