

Operation of the European XFEL vacuum system

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The European XFEL (EuXFEL) is a 3.4 km long free electron laser that started commissioning in 2016. The machine can be divided into the superconducting LINAC with a length of 1.7 km and the following SASE sections. The latter sections use the accelerated electron beam with energies up to 17.5 GeV to generate 27,000 ultra-short flashes per second with a wavelength of 0.05 nm to 4.7 nm. These properties - unique to any free electron laser worldwide - allow researchers to explore ultra-fast processes on a femtosecond scale.

This presentation will provide an overview of the operation of the EuXFEL vacuum system since 2016. It shall focus on the performance of the vacuum systems in the cold and warm sections of the electron beam lines. The concepts achieved during the design phase will be explained and resulting effects for daily operation and shutdown tasks highlighted. It will deal with unexpected challenges during commissioning, with the control of the system itself as well as permanent ongoing modifications. Finally, the increasing amount of particulate free sections and their influence on the procedures concerning the main vacuum system will be pointed out.

Summary

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