



Contribution ID: 2386 Contribution code: THPM013

Type: **Poster Presentation**

Mechanical characterization of the BPMs brazing interface for Sirius storage ring

Thursday, 11 May 2023 16:30 (2 hours)

The Beam Position Monitor (BPM) is one of the crucial components for Sirius, and they were manufactured in the Materials Group –CNPEM, through the vacuum brazing process. The mechanical strength characterization of the brazed interface is extremely important to protect the storage ring from unwanted leaks in case of breakage of these sensors. The objective of this work is to report the tests used to determine the maximum load resisted by the brazed sensor before leaking. During the tests, the sensors were subjected to load in axial and perpendicular directions, so that brazing was tested under tension and shear loads. During the tests, the sensors were subjected to a vacuum atmosphere, attached to a leak detector and a continuous flow of He gas until leakage was detected. For all cases in axial load, a plastic deformation at the tip of the electrode is visually noticed and brittle fracture in the ceramic was observed. The mechanical strength of brazing interface was superior to that of the ceramic itself. The samples submitted to the brazing shear test showed continuous bending of the electrode until the end of course of the machine, with no leaks. Summarizing, the values of the tensile tests are in the same order of magnitude as data in the literature, although here we also considered the tightness under vacuum, which was maintained until the collapse of the test specimens.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary authors: BAGNATO, Osmar (Brazilian Synchrotron Light Laboratory); DEFAVARI, Rafael (Brazilian Synchrotron Light Laboratory)

Co-authors: FRANCISCO, Fernanda (Brazilian Synchrotron Light Laboratory); KAKIZAKI, Daniel (Brazilian Synchrotron Light Laboratory)

Presenter: BAGNATO, Osmar (Brazilian Synchrotron Light Laboratory)

Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T35: Advanced Manufacturing Technologies for Accelerator Components