



Contribution ID: 119

Type: Poster

## Alumina ceramics vacuum chambers for injection magnets and their support configuration in the J-PARC RCS

*Tuesday 19 June 2018 18:00 (20 minutes)*

Alumina ceramics vacuum chambers are used in half the area of the whole ring in the J-PARC RCS to reduce eddy current effects due to rapidly varying magnetic field. The cross sections of these chamber are race track and circular used in dipole magnets, in quadrupole magnets, respectively and the chambers which are installed in injection magnets have several kinds of cross section which are ellipse, rectangular and racket-shape. A TiN film of 15 nm thick is formed inside the chambers for suppressing secondary electron emission, and copper stripes are mounted by epoxy adhesive outside the chambers for lowering the beam impedance.

All ceramics chambers of RCS are placed on the holding jig which is made by epoxy resin and alumina fiber mat for avoiding eddy current effect due to a rapid-cycling magnetic field. It was found that the radiation damage of epoxy resin used for the holding jig was small, because the tensile strength of the epoxy resin was still kept more than 300 MPa after gamma ray irradiation of 30 MGy.

These alumina ceramics vacuum chambers and also their support have worked very well and the RCS has been operated stably for ten years.

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**Session Classification:** Poster Session Tuesday

**Track Classification:** Vacuum in Accelerators