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Ceramics in particle accelerators

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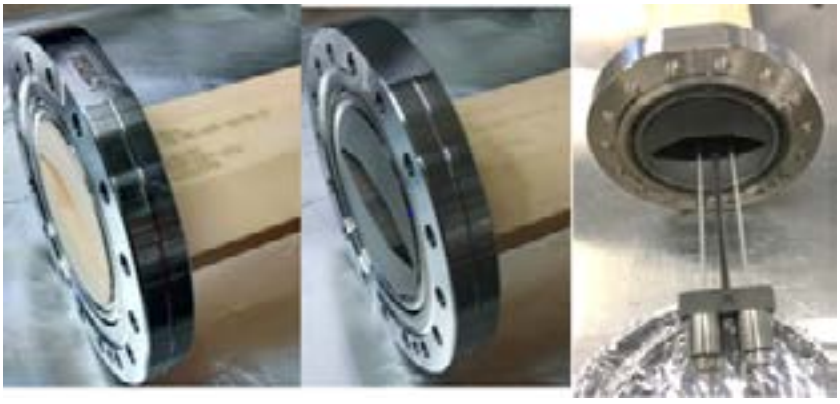
Ceramics help to solve several very challenging problems which are common in particle accelerators and x-ray science experiments. From providing electrical isolation and multipin vacuum feed throughs to magnetically transparent vacuum chambers, ceramics are the ideal material. In this presentation author will give an overview of some of the common uses of ceramics at NSLS-II as well as some of the more specialized ceramic vacuum chambers. Author will also go over some of the recent coating developments at Brookhaven which use DC magnetron sputtering to apply a thin layer of titanium to ceramic chambers. This film provides a conductive layer for the image currents generated by the stored particle beam while minimizing Eddy currents produced by the fast pulsing magnets required for beam injection.



Biography

Charles Hetzel has held the title of Lead Project Engineer for a design and manufacturing organization which produced automated industrial machinery prior to joining NSLS-II. Upon joining the NSLS-2 project he was responsible for the design, procurement and fabrication of the storage ring vacuum chambers including the integration of these chambers into the magnet-girder assemblies and final installation in the storage ring tunnel. He also managed the production of the rf shielded bellows for interconnecting the storage ring vacuum chambers as well as the photon absorbers which protect critical components. He took over as the Vacuum Group Leader at NSLS-2 in 2014 and continues to resource plan and schedule major installation efforts. Most recent efforts are focused on the design and development of a thin film coating system for ceramic vacuum chambers.

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