Contribution ID: **19**　　　　　　　　　　　　　　　　　　　　Type: **not specified**

Complex Bend Vacuum Chamber for NSLSII-U

Wednesday, 17 April 2024 13:30 (25 minutes)

While the NSLSII synchrotron is a third-generation light source providing outstanding brightness and flux, there is a robust R&D program in place to upgrade to a fourth generation, or beyond, facility. Inherent in the so-called complex-bend magnet and lattice designs are significant limitations on the beam and exit slot apertures of the vacuum chamber. These restrictions and the need for the vacuum chamber to be mechanically aligned and decoupled from the magnets impose unique challenges. As part of the design process, a thorough survey of existing fourth generation machines was completed to look at existing design solutions for accommodating beam and for providing adequate conductance and pumping. For our chamber, the selected solution is not novel and utilizes an aluminum split clamshell design that has been done in many machines past and present. The adaptation of this design along with improved machining and welding should provide the most cost-effective solution. The geometrical and impedance solutions and structural and thermal modeling will be shown along with dynamic pressure simulations generated by Synrad and Molflow modeling code. With continuing changes in lattice and magnet parameters, a systematic, iterative approach to vacuum design has been implemented and will be presented.

Summary

Primary authors: Dr KHAN, Aamna (Brookhaven National Laboratory); Dr HIDAS, Dean (Brookhaven National Laboratory); JUNI FERREIRA, Marcelo (European Spallation Source ERIC); SEEGITZ, Michael (Brookhaven National Laboratory); TODD, Robert; PALECEK, Paul (Brookhaven National Laboratory); Dr SHARMA, Sushil (Brookhaven National Laboratory); SHAFTAN, Timur (Brookhaven National Laboratory); Dr SMALYUK, Victor (Brookhaven National Laboratory)

Presenter: SEEGITZ, Michael (Brookhaven National Laboratory)

Session Classification: Session 4