

## Design of the vacuum system for the elliptical multipole wiggler at the Advanced Photon Source

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A vacuum system for the APS Elliptical Multipole Wiggler (EMW) that will operate at a pressure of  $10^{-9}$  torr with a storage ring current of 100 mA at 7.0 GeV has been designed and is being fabricated. The major part of the system is a stainless steel chamber with a 67.4-mm by 19.4-mm rectangular cross section. The length of the vacuum chamber is 3100 mm and the wall thickness is 1.3 mm. Two versions of the vacuum chamber will be produced: with and without distributed nonevaporable getter (NEG) pumping. The version with NEG pumping will have slides on the top and bottom walls to accommodate sintered plates available from SAES. To activate these plates, the entire vacuum chamber will be baked from the outside up to a temperature of 350°C-450°C. Provision for the baking is included in the design of the vacuum system, its support, and in the EMW itself. The complexity introduced into the design by the need for external activation of the NEG plates is eliminated in the design of the second version of the chamber. In this chamber, a sufficiently low outgassing rate may be achieved by extensive surface cleaning and baking in a vacuum furnace ( $10^{-6}$  Torr) up to a temperature of 950° C as has been achieved at ESRF [1]. The actual vacuum performance of this chamber will be compared to the performance of the NEG-pumped chamber. Both versions are being pursued in parallel.

[1] J. M. Lefebvre and N. Rouviere, private communication.

Work supported by U.S. Department of Energy, Office of Basic Energy Sciences, under Contract No. W-31-109-ENG-38.