

Can electron multipacting explain the pressure rise in a cold bore superconducting undulator?

Saturday, October 9, 2010 11:30 AM (30 minutes)

Preliminary studies performed with the cold bore superconducting undulator installed in the ANKA (Angstrom source Karlsruhe) storage ring suggest that the beam heat load is mainly due to the electron wall bombardment. Electron bombardment can both heat the cold vacuum chamber and induce an increase in the pressure because of gas desorption. In this contribution we compare the measurements of the pressure in a cold bore performed in the electron storage ring ANKA with the predictions obtained using the equations of gas dynamic balance in a cold vacuum chamber exposed to synchrotron radiation and electron bombardment. The balance results from two competing effects: the photon and electron stimulated desorption of the gas contained in the surface layer of the chamber wall and of the gas cryosorbed, and the cryopumping by the cold surface. We show that photodesorption alone cannot explain the experimental results and that electron multipacting is needed to reproduce the observed pressure rise. Electron bombardment can at the same time explain the observed beam heat load.

<http://prst-ab.aps.org/abstract/PRSTAB/v13/i7/e073201>

Primary author: Dr CASALBUONI, Sara (Karlsruhe Institute of Technology)

Co-authors: Dr SAEZ DE JAUREGUI, David (Karlsruhe Institute of Technology); Dr HAGELSTEIN, Michael (Karlsruhe Institute of Technology); Dr TAVARES, Pedro (Karlsruhe Institute of Technology); SCHLEEDE, Simone (Karlsruhe Institute of Technology)

Presenter: Dr CASALBUONI, Sara (Karlsruhe Institute of Technology)

Session Classification: Updates from Operating Machines

Track Classification: Oral Sessions