



Contribution ID: 99

Type: **Poster Presentation of 1h45m**

Improvement of Field Simulation Concept of Staggered Undulator with HTS YBCO Bulk

Thursday, August 31, 2017 1:45 PM (1h 45m)

An undulator with a strong magnetic field in a short period will become an important light source device in an accelerator storage ring or a free-electron laser. The bulk YBCO can be used to construct a high-temperature-superconducting undulator with staggered array structure. The bulk YBCO of diameter 32 mm and thickness 2.5 mm was constructed and assembled as a staggered magnet array. The period length was 5 mm; the magnet gap is 4 mm. To estimate the strength of a sinusoidal field and to optimize the end-pole design to minimize the first field integral (i.e. electron angle) and second field integral (electron position), an energy-minimization method (EM-method) based on Bean's model to simulate the field trapped in the HTS-Bulk is introduced. In this paper we focus on promoting the practical value of the EM-method simulation. Aggregating the experience of measurement of the bulk YBCO undulator at 77 K and 7 K and the experience of simulation work based on the EM-method, we tackle some issues to enhance the integrality of this undulator design work.

Submitters Country

Taiwan

Primary authors: Dr CHEN, S.D. (National Synchrotron Radiation Research Center); Mr CHIANG, C.A. (Science and Technology of Synchrotron Light source in Department of Physics, National Tsing Hua University); Dr YANG, C.M. (Department of Material Science and Engineering, National Cheng Kung University); LUO, H.W. (Department of Engineering and System Science, National Tsing Hua University); Dr JAN, J.C. (National Synchrotron Radiation Research Center); Prof. CHEN, I.G. (Department of Material Science and Engineering, National Cheng Kung University); Dr HWANG, C.S. (National Synchrotron Radiation Research Center)

Presenter: Dr CHEN, S.D. (National Synchrotron Radiation Research Center)

Session Classification: Thu-Af-Po4.03

Track Classification: A3 - Wigglers and Undulators