**IMMW 14** 



Contribution ID: 12

Type: not specified

## Warm-Cold Changes in the Sextupole Harmonic in the Quadrupole Magnets for the BEPC-II Luminosity Upgrade

BNL is building a pair of compact multi-function superconducting magnets to be placed inside the BES experimental detector solenoid for a luminosity upgrade of the

Electron Positron Collider (BEPC-II) at IHEP, Beijing. These magnets are produced by a direct wind technology, originally developed at BNL for the HERA luminosity upgrade at DESY. The main quadrupole layers of the magnets, in particular, have a very stringent field quality requirement, and consist of four double layers of a 6around-1 conductor. Results of warm measurements after winding each double-layer were used to cancel any unwanted harmonics by suitably changing the next layer. It was possible to achieve excellent field quality, as measured warm, using this approach. However, when tested cold, both magnets showed a rather large change in the sextupole terms. Several possible causes for this change, including an influence of the measuring coil alignment resulting from a unique feature of the magnet coil, were investigated. The problem was finally traced to an unexpectedly high ferrite content in a small azimuthal region of the stainless steel tubes used for the coil support. This paper will discuss the possibilities considered, and the

various magnetic measurements carried out to understand the warm-cold difference.

## Summary

Large warm to cold changes were observed in the sextupole harmonic of quadrupole magnets. Various possibilities were investigated to understand these changes with the help of suitable magnetic measurements.

Author: Dr JAIN, Animesh (Brookhaven National Laboratory, USA)

**Co-authors:** Mr GANETIS, George (Brookhaven National Laboratory); Dr WANDERER, Peter (Brookhaven National Laboratory)

Presenter: Dr JAIN, Animesh (Brookhaven National Laboratory, USA)

Track Classification: Measures