World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:14, No:05, 2020

Iron Yoke Dipole with High Quality Field for Collector Ring FAIR

Authors : Tatyana Rybitskaya, Alexandr Starostenko, Kseniya Ryabchenko

Abstract : Collector ring (CR) of FAIR project is a large acceptance storage ring and field quality plays a major role in the magnet design. The CR will use normal conducting dipole magnets. There will be 24 H-type sector magnets with a maximum field value of 1.6 T. The integrated over the length of the magnet field quality as a function of radius is $\Delta B.l/B.l = \pm 1x10^{-4}$. Below 1.6 T the value $\Delta B.l/B.l$ can be higher with a linear approximation up to $\pm 2.5x10^{-4}$ at the field level of 0.8 T. An iron-dominated magnet with required field quality is produced with standard technology as the quality is dominated by the yoke geometry.

Keywords : conventional magnet, iron yoke dipole, harmonic terms, particle accelerators
Conference Title : ICMT 2020 : International Conference on Magnet Technology
Conference Location : Rome, Italy
Conference Dates : May 04-05, 2020