

## STUDENT SECTION

### Design a Cryogenic Structure for a 1.1 MW Synchronous Motor with HTS Field Winding

M. Kashani<sup>\*</sup>, M. Hosseina<sup>†</sup>, A. Darabi<sup>\*\*</sup> and A. Maddadi<sup>\*\*\*</sup>

<sup>\*</sup> Faculty of Electrical & Robotic Engineering, Shahrood University of Technology, Shahrood, Iran,  
kamran.unk@gmail.com

<sup>†</sup> Faculty of Electrical & Robotic Engineering, Shahrood University of Technology, Shahrood, Iran,  
majidhosseina@gmail.com

<sup>\*\*</sup> Faculty of Electrical & Robotic Engineering, Shahrood University of Technology, Shahrood, Iran,  
darabi.ahmad@hotmail.com

<sup>\*\*\*</sup> Faculty of mechanical Engineering, Shahrood University of Technology, Shahrood, Iran

*Abstract*— Nowadays HTS machines have got more attentions than before. With daily development of superconducting technology, due to their positive advantages, usage of this kind of machines are considerably increased. Due to operate normally, each HTS machine needs a cryogenic system. Cryogenic system has an important role in maintaining superconducting windings in superconducting state. Considering where the HTS windings are placed in the superconducting machine, structure of cryogenic system may change. For example the structure of the cryogenic system for HTS machine with superconducting rotor windings is different from superconducting stator winding ones. Because of rotational motion of the rotor in a synchronous machine, designing cryogenic structure for superconducting rotor windings is much harder. Here in this paper designing a cryogenic structure for a synchronous model motor with superconducting rotor winding has been considered. It was tried to present a practical cryogenic structure for this specific model motor. The designed structure was shown with figures respectively.