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Design and Research of Cryostat for 3W1 SC Wiggler Magnet

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The cryostat with cryocoolers for the Wiggler is capable of keeping helium consumption close to zero (less than 0.03 l/hr in average per year). The wiggler magnet is placed into a bath with liquid helium of 4.2K and all heat emission inside the magnet and heat in-leak outside lead to liquid helium evaporation process. The cryostat chiefly consists of external vacuum housing, 60 K shield screens, liquid helium vessel with a SC multipole magnet inside, vacuum chamber (beam duct) with copper liner inside, four 2-stage coolers with stage temperature 4.2K/60 K. Current leads heat in-leak interception in vacuum using cryocoolers. The helium vessel is suspended with four vertical and four horizontal CFRP(T300) tension rods connected to the external cryostat vessel. These tension rods pass throughout the 60K shield screens and attach to bolts on the external housing walls and are used for precise alignment of the vertical magnet position.

Submitters Country

CHINA

Primary authors: Mr XU, Miaofu; Mr GE, Rui (colleague); Ms BIAN, lin; Mr ZHANG, Xiangzhen

Presenter: Mr XU, Miaofu

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