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The hydrogen circulation cold box of CSNS cryogenic system

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CSNS cryogenic system offers 1.5 MPa hydrogen as a neutron moderator at 18 ~ 22 K, and the para hydrogen concentration is higher than 99%. Two cold boxes were adopted, one is hydrogen circulation cold box and the other is accumulator cold box. The main equipments in the hydrogen circulation cold box are ortho-para converter, H₂-He heat exchanger, hydrogen circulators and hydrogen heater. And the accumulator was arranged in the accumulator cold box. Design proposal of the CSNS hydrogen circulation cold box was analyzed, and the structure of the cold box was determined. Double-cold boxes with external instrument control cabinet were selected. This paper introduced the engineering design, strength check, thermal loss analysis and the processing technology of the two cold boxes.

Primary author: Ms WANG, yaqiong (Institute of High Energy Physics)

Co-authors: Dr WANG, Guoping (Institute of High Energy Physics(IHEP)); Ms DING, Meiying (Institute of High Energy Physics); Mr YE, bin (Institute of High Energy Physics); Mr HE, chongchao (Institute of High Energy Physics); Mr HE, kun (Institute of High Energy Physics); Ms LI, na (Institute of High Energy Physics); Ms ZHANG, yu (Institute of High Energy Physics)

Presenters: Dr WANG, Guoping (Institute of High Energy Physics(IHEP)); Ms WANG, yaqiong (Institute of High Energy Physics)

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