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Design of Cryogenic Distribution System for RAON

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The helium distribution system of RAON is being developed by the Rare Isotope Science Project (RISP) in South Korea. The Helium Distribution System (HDS) consists of a distribution box, helium transfer line, and valve box to supply 4.5 K super-critical helium to each cryogenic component reliably and efficiently. The helium transfer line will be installed in the linac tunnel with a total length of 700 m. Five service lines will be used; super-critical helium supply (4.5 K, 3 bar), gas helium return (5˜8 K, 1.05 bar), gas helium shield supply and return (40˜70 K), and sub-atmospheric gas helium return (3 K, 0.03 bar) lines. The heat loads and pressure drops at each line are the most important factors for the pipe design of the helium transfer line. This work shows the results of the thermal analysis and flow dynamics of RAON's HDS.

Primary author: Mr LEE, Ki Woong (Institution for Basic Science)

Co-authors: Dr CHOI, Chul Jin (Institution for Basic Science); Dr HYUN-MAN, Jang (Institution for Basic Science)

Presenter: Mr LEE, Ki Woong (Institution for Basic Science)

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