Contribution ID: **128** Type: **Poster**

The Design of DRAGON-V Loop for Key Technique Verification of Liquid PBLI Blanket

Monday, 5 June 2017 13:40 (2 hours)

The liquid Lead Lithium (PbLi) blanket is one of the most promising blanket concepts for fusion reactors. Aiming to better develop the PbLi blanket technology and realize engineering application, key issues of PbLi blanket should be investigated such as material corrosion, the magnetohydrodynamic (MHD) effect and so on. In addition, the integrated tests and engineering design validation of PbLi blanket module should be performed as well. So, it is necessary to develop experimental platforms to study the key issues of PbLi technology for fusion reactor.
At present, a series of PbLi experimental loops have been designed and built successfully by FDS Team such as DRAGON-I/II and DRAGON-IV. Some experiments have been conducted to investigate the corrosion behaviors of CLAM steel in magnetic field, the purification technology of liquid PbLi and MHD pressure drop test. To support the engineering design validation of DEMO blanket with the parameters covering the requirements of ITER-TBM and China DEMO, a dual coolant thermal hydraulic integrated experimental Loop DRAGON-V was designed, which can be used to study the integrated experiments under the multi physical field conditions for fusion reactor. It is composed of lead-lithium loop and helium loop. The maximum temperature in the test section is designed to be 1100 ℃, the maximum flow rate of PbLi can reach 40 kg/s, and the magnetic fields is up to 5 T. The maximum helium pressure is 10.5 MPa. It can carry out the research of material corrosion under different magnetic fields, MHD test for components of liquid blanket and LOCA. The obtained findings can support the development of the key techniques in-pile and the engineering design of China DEMO reactor. Besides, it can also be used for the advanced Generation-IV reactors and civil application.

Eligible for student paper award?

No

Authors: HUANG, wangli; Dr ZHU, zhiqiang; Dr SUN, lujun; Dr XIAO, zunqi

Presenter: Dr ZHU, zhiqiang

Session Classification: M.POS: Poster Session M

Track Classification: Blankets and tritium breeding