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## Thu-Mo-Po.05-06: Research on the mechanical performance of REBCO CICC sub-cable for fusion reactor

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To fulfill the requirement of the high field ( $> 15$  T) and high current carrying capacity ( $> 40$  kA) superconducting magnets for the next-generation fusion reactor, the Institute of Plasma Physics, Chinese Academy of Sciences, proposed two kinds of CICC design concepts, which are both manufactured from a sub-cable. The sub-cable is formed by winding REBCO tape around a stainless steel spiral tube. The combination of high operating current and high magnetic fields results in large Lorentz forces on the sub-cable that could cause irreversible degradation. Therefore, It is important to improve the mechanical strength of sub-cables. In this report, the mechanical performance of REBCO CICC sub-cable will be reported, for example, tensile, and transverse compression. In addition, the influence mechanism of the structural parameters for sub-cable on its mechanical performance will be elucidated, the cable structural design with high mechanical strength will be proposed. These research results will promote the development of high field superconducting magnet technology, and provide important data for the design of future fusion magnets.

**Authors:** XIAO, Guanyu (ASIPP); Mr WANG, Le (ASIPP)

**Co-author:** Ms JIN, Huan (ASIPP)

**Presenter:** XIAO, Guanyu (ASIPP)

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