



Contribution ID: 1088 Contribution code: THU-PO3-LN2-02

Type: Poster

## Analysis and design of Control Sequence for Multi-Stage and Ultrahigh Magnetic System at WHMFC

*Thursday, 18 November 2021 10:00 (2 hours)*

In order to meet the needs of scientific research, a Multi-stage Ultrahigh and Magnetic System (MUMS) has been developed at Wuhan national pulsed High Magnetic Field Centre (WHMFC) for generating 100 T magnetic field. Based on multi-stage technology, MUMS is composed of outer, middle and inner coils with three corresponding pulsed power supplies, and the field waveforms from three coils are superimposed at the right moment to obtain a higher magnetic field. Due to the complex structure of MUMS, the paper introduces a design method of control sequence to ensure the reliable and efficient operation. Firstly, the whole operation process of magnetic system is decomposed into a series of continuous actions to establish the operation process model. On the basis, for the complex coupling relationships between all sequence actions, a planning method based on directed graph is proposed to design the control sequence, which can be directly described and acted step by step in the control system. Finally, MUMS has been tested with the designed control sequence, and 94.7 T magnetic field has been achieved. The results verify the validity of the design method, and it also can be applied to the design of other complex magnetic systems.

**Primary authors:** SHI, Jiangtao (Huazhong University of Science and Technology); ZHANG, Shaozhe (Wuhan National High Magnetic Field Center, Huazhong University of Science and Technology); HAN, Xiaotao (Wuhan National High Magnetic Field Center, Huazhong University of Science and Technology); XIE, jianfeng (Huazhong University of Science and Technology)

**Presenter:** HAN, Xiaotao (Wuhan National High Magnetic Field Center, Huazhong University of Science and Technology)

**Session Classification:** THU-PO3-LN2 Late News II

**Track Classification:** C: Magnets for High-Field Facilities: C02 Resistive and Pulsed High-Field Magnets