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## **Mon-Af-Or4-02: Preliminary Analysis on the Failure of a 100 T pulsed magnet at the WHMFC**

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A 100 T pulsed magnet of triple coils was developed in WHMFC in 2018, the outer coil was powered by a 100MJ/100MW pulsed generator, and the middle and inner coils are energized by capacitor banks. The inner and middle coils are made of CuNb wire, and copper wire for the outer coil, the outline size of the magnet is 800 mm in O.D. and 1200mm high. The magnet failed at about 83 T during test, however, the magnet does not blow up and still remain intact after failure. All the current of the positive and negative ends for the three coils were measured, the experimental results show that the current of the positive end does not equal that the negative end for both middle coil and outer coil, and the difference between positive and negative ends of middle coil equals that the difference of both ends of the outer coil. This means electrical breakdown happens between the middle coil and outer one in lateral direction. It was found that indeed there was a breakdown path between the outmost layer of middle coil and the inner-most layer of outer coil after the magnet being disassembled and cut open. Moreover, many places of the windings of middle coils were burned and some part of windings fractured, and windings even penetrated into the reinforcement in some place. The magnet broke in a relative low field, and the stress may not be the primary reason. The reasons for the magnet failure are complicated, it may be the overvoltage, or defective conductor and structural instability like buckling, and all this will be discussed in this paper.

**Author:** XIAO, Houxiu

**Co-authors:** PENG, Tao (Wuhan National High Magnetic Field Center); Mr LI, Xiaofeng; Dr WANG, Shuang; Prof. LI, Liang

**Presenter:** XIAO, Houxiu

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