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Tue-Mo-Po2.06-02 [33]: Magnetic and Finning Force behavior on Nb₃Sn Strands Subjected to Transverse Deformation for 14 T MRI Superconducting Magnet

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The Nb₃Sn Rutherford cable and composite conductor is developed for 14T Magnetic Resonance Imaging (MRI) magnet project in China. Part of the project is devoted to the Electromagnetic (EM) behaviors studies of the deformed Nb₃Sn strands from the cabling process. The magnetization characteristic of deformed Nb₃Sn strands by artificial rolling method which simulates the transverse deformation is studied. The magnetization results are explained not only by the aspect ratio, but also the sintering or merging of sub-elements combined the microscopy analysis. The pinning force characteristic is also studied at 20 and 40 % deformation. The upper critical field (B_{c2}) and critical temperature (T_c) are derived. The results shows the B_{c2} and T_c of the deformed strands are all degraded compared to the un-deformed strand and the possible explanations are discussed. The study permits to better understand and the pinning force behavior and transport current degradation of Nb₃Sn strand from cabling process, which can provide the important reference for cable design and Nb₃Sn strand choice.

Primary author: Prof. YI, Shi (Institute of Plasma Physics, China)

Presenter: Prof. YI, Shi (Institute of Plasma Physics, China)

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