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## **Nb<sub>3</sub>Sn strand designs and heat treatments for high field magnet applications**

*Thursday, August 31, 2017 8:45 AM (15 minutes)*

In recent years Nb<sub>3</sub>Sn strand made by the internal tin process has been proven as an industrial scale high field conductor, previously by the high volume production for ITER and presently for the CERN High Luminosity upgrade. Strand manufactured by a flexible internal tin Nb<sub>3</sub>Sn method may be readily customized for particular applications. The challenge for particle accelerator applications is to maintain high J<sub>c</sub> and RRR in strands with effective filament size < 40 microns, and new heat treatments have shown this to be possible with existing strand architectures. We are also continuing to modify the RRP® strand architecture in order to improve properties at lower subelement size. For magnet application where larger effective filament diameters are acceptable, RRP® strands can reach over 1400 A/mm<sup>2</sup> at 16T, and we will show our work in increasing this value to the target of 1500 A/mm<sup>2</sup> at 16T for FCC. We are continuing to develop RRP® distributed barrier and single barrier strands having small effective filament diameters for fast ramping laboratory magnets, and strands with low hysteretic losses for use in low or cryogen free magnets.

### **Submitters Country**

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