

## **Ultra-High Magnetic Field Applications for Coated Conductors**

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***Abstract*** – There is a revolution underway in high field magnet technology that has been enabled by coated conductors (CC) becoming viable for high field applications. Recently the record field made an unprecedented jump from 23.5 T to 32 T in less than twelve months. The previous increase of 8 T took approximately 40 years! While only three groups worldwide have delivered magnets operating beyond 23.5 T to date, there are at least seven groups working on such magnets presently with multiple ones anticipating completion this year.

This dramatic increase in field is due partly to the current-density of CC but mainly due to the high mechanical strength and stiffness and the relative ease of coil fabrication. While CC is being productively employed presently, there are still significant challenges that limit application. In particular, the predictability of the critical current of the CC, the presence of screening currents in the CC, and the means of protecting the CC during high current-density quench are matters presently being addressed. The presentation will focus on magnets presently being developed for operations at fields higher than 23.5 T along with how the various groups are addressing these critical challenges.

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