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Towards Robust High Field Performance in Bulk HTS Magnets

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In 2014 we reported a record trapped field of 17.6T in an HTS bulk at 26K. While this was a pleasing achievement it did not pave the way immediately to practical operation at such high fields. Significant challenges remain including the fact that individual samples tend to only achieve high fields once, being damaged in the process and that most samples fail at fields much below the headline world record field.

In this talk I will report on progress that has been made in the Cambridge group in addressing these concerns. I will report on a new “Hybrid Stack” approach that has allowed us to achieve repeated magnetisation to 17.6T as well as progress in incorporating Silicon Carbide fibres into bulks to provide intrinsic reinforcement. Underlying this I will discuss our increased understanding of the behaviour of bulks under large magnetising forces.

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