High-current HTS Cables for Magnet Applications

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Abstract — It has been more than 25 years since the discovery of High Temperature Superconductors and following their utilization in power cable applications and layer-wound magnets, they are now being considered for future high-current, high-field magnets typically used in high-energy physics and fusion machines.

Discussions of the requirements and the desired targets needed for applications using high-current and high-field magnets will be presented together with a summary of the present status of the conductors currently being developed.

Various cable concepts to be used in large magnets and their advantages and disadvantages will be discussed addressing the following: What can we do with the conductors we have? What do we need and how can we achieve it?

Keywords (Index Terms) — high-current HTS cables, high-field superconducting magnets, BSCCO-2212, REBCO