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[Invited Oral] Long-length YBCO coated conductors manufactured in medium size pilot production line based on pulsed laser deposition

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Pulsed laser deposition (PLD) was implemented in processing of high quality coated conductors of long length. Experimental data on YBCO coated conductor (CC) tapes with a length up to 200 m processed employing a multi-beam PLD (MB-PLD) technique with a throughput up to 40m/hour are presented. The YBCO films were deposited onto stainless steel substrate tapes preliminary coated with bi-axially textured yttria-stabilised-zirconia buffer layer and CeO₂ cap layer. Possibilities for further gain of the throughput is demonstrated and discussed.

Using optimized conditions we deposited a number of 4mm wide YBCO coated tapes, each with a length up to 200 m. Critical currents measured in these tapes with linear resolution of 0.3 mm were in between 200 and 400 A/cm-width (at 77K in self-field). Obviously, these tapes represent so far the longest coated conductors manufactured in Europe.

Homogeneity, connectivity, local weak zones and their influence to quench behaviour are studied together with critical current densities in YBCO coated conductors.

Outstanding behavior of critical current in high magnetic fields was demonstrated in tapes with artificial and "intrinsic" pinning. In 18 T field by $B \parallel c$ and 4.2 K, the tapes are capable to carry critical currents up to 1.2 kA/cm-width. This seems to be the highest values observed so far.

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