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Application of direct diffusion bonding technique for preparation of low-resistivity joint in REBCO coated conductors

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Low resistivity joint technique for high- T_c superconducting (HTSC) tapes is one of the most indispensable techniques for practical applications. At the present time the solder joint technique is widely used for joining HTS tapes for the non-superconducting joint. However, in the case of a joint using a solder, the resistance across the joint cannot be very low because of relatively high resistivity of soldering material. Thus in the present study, we propose solid phase joining technique to make direct joint of REBCO tapes, as an alternative to solder joining technique. In this solid phase joining technique, we directly join the copper stabilizing layer and get rid of the soldering material, so that we can expect reduction of joint resistivity. We have succeeded in joining REBCO tape with this technique. The measured resistivity was about 23.2 nOhm for 20mm joint at LN2 temperature. The details of joining procedure and its properties will be shown in the presentation.

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