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TITRE : Combined analysis method applied on the study of texture of $Bi_2Sr_2CaCu_2O_8$ bulk superconductor samples

RÉSERVÉ

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Nexans SuperConductors (Hürth, Germany) synthesize bulk high temperature superconductors of $Bi_2Sr_2CaCu_2O_8$ used in industrial applications like cables or fault current limiters. Even if they are weakly textured high superconducting currents are able to flow trough these materials. A weak texture means that grains are not all aligned according to a preferred orientation. If these grains are randomly oriented, they induce in the path of current flow a high amount of grains boundaries and thus increase risks of current losses.

The aim of this study is to correlate the preferred orientation of grains with the macroscopic properties of bulk $Bi_2Sr_2CaCu_2O_8$ materials differing from shape and synthesis parameters. This correlation may reveal how each studied parameter affect the superconducting current and how it is possible to increase it.

Combined analysis method is used to study preferred orientation at various length scales, from macroscopic (neutron experiments) to surface (X-ray experiments) down to microscopic (electron back-scattering diffraction). The complementarity of the sources will be a plus to characterize texture. Results showed that the studied samples are multiphasic and present a variation of texture across their wall thickness.

In conclusion, a correlation between preferred orientations obtained on various samples and their macroscopic properties will permit the determination of parameters that influence the value of the superconducting current in order to increase its value.

A retourner impérativement avant le avant le 18 mai 2012 à

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