

## A Study of Current Stability in the Dissipative Flux Flow State of Superconducting Films

Gaia Grimaldi, Antonio Leo, Angela Nigro,  
Elena Bruno, Francesco Priolo, and Sandro Pace

**Abstract** - In several superconducting applications low energy losses are strictly demanding. In superconducting films, the dissipative flux flow state competes to the stability of the superconducting state in those devices which can operate just above the critical current ( $I_c$ ). Therefore, details of the current-voltage (I-V) characteristics and in particular of current instabilities from the flux flow state to the normal one can become significant. We study current stability in the flux flow dissipative state by a proper current-voltage measurement mode. Low temperature superconducting films have been investigated to probe that the current stability range above  $I_c$  can be increased by light ion irradiation.

**Keywords** - critical current, current-voltage characteristics, instability mechanisms, superconducting films

IEEE/CSC & ESAS European Superconductivity News Forum (ESNF) No. 22 October/November 2012. ESNF Reference No.ST299 Category 2, 5.

The published version of this preprint appeared in *IEEE Transactions on Applied Superconductivity* 23, 8200704 (June 2013).