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Melting of vortex solid phase in irradiated $Bi_2Sr_2CaCu_2O_{8+\delta}$ single crystals in tilted magnetic fields JOVAN MIRKOVIC, Inst of Materials Science, Univ of Tsukuba, 305-8573 Tsukuba, Japan, and Faculty of Sciences, Univ. of Montenegro, Podgorica, Serbia and Montenegro, SERGEY SAVEL'EV, Frontier Research System, The Institute of Physical and Chemical Research (RIKEN), Wako-shi, Saitama, 351-0198, Japan, HIROKAZU SATO, TAKASHI YAMAMOTO, ITSUHIRO KAKEYA, Institute of Materials Science, University of Tsukuba, 305-8573 Tsukuba, Japan, FRANCO NORI, Frontier Research System, The Institute of Physical and Chemical Research (RIKEN), Wako-shi, Saitama, 351-0198, Japan, KAZUO KADOWAKI, Institute of Materials Science, University of Tsukuba, 305-8573 Tsukuba, Japan — The boundary between the vortex-solid and the vortex-liquid in $H_c - H_{ab}$ phase plane for irradiated $Bi_2Sr_2CaCu_2O_{8+\delta}$single crystals is studied by measuring the local ac-magnetic permeability by using the miniature coils in tilted magnetic fields. It was found that the c-axis magnetic field component at the phase transition decreases linearly when increasing the in-plane magnetic field at high temperatures even in a wider angular range than in pristine samples. At lower temperatures, this linear decrease transforms to a concave (hyperbolic-like) curve that differs even stronger from the usual elliptical phase boundary derived from Ginzburg-Landau theory. A theoretical approach to this challenging problem is discussed.

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