Magnetic flux oscillations in partially irradiated $Bi_2Sr_2CaCu_2O_{8+\delta}$

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We report on generation of spatiotemporal oscillations of magnetic flux in a $Bi_2Sr_2CaCu_2O_{8+\delta}$ crystal irradiated in part with 2.2 GeV Au ions. Flux oscillations are spontaneously excited after exposing the sample to a steady magnetic field near the order-disorder vortex phase transition line.The oscillations originate at the border between the irradiated and nonirradiated parts of the sample and propagate into the nonirradiated region toward the sample edge. Previously reported flux oscillations were observed in the vicinity of undefined defects in as grown $Bi_2Sr_2CaCu_2O_{8+\delta}$ crystals. Observation of spontaneous oscillations in partially irradiated samples present the first attempt to generate such oscillations in a controlled manner.