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Enhancement in flux pinning in superconducting Bi-Sr-Ca-Cu-O H. YETIS, A. KILIC, K. KILIC, A. ALTINKOK, M. OLUTAS, Abant Izzet Baysal University — It is shown that the pinning properties of $Bi_{1.7}Pb_{0.3}Sr_2Ca_2Cu_3O_x$ (BSCCO) can be increased by drilling a macroscopic cylindrical hole (CH). To observe the enhancement in flux pinning two different standard and reverse procedures in measuring of the I-V curves were performed as functions of transport current (I), temperature (T) and external magnetic field (H). For a better description, during the measurements, the sweep rate (dI/dt) of transport current in I-V curves was varied. As the current cycles in up and down direction, it was observed that the presence of CH drilled in BSCCO sample causes a dramatic increase in the hysteresis effects in I-V curves depending on dI/dt and changes the evolution of I-V curves as compared to that of similar measurements carried out in BSCCO sample before drilling CH. Another important observation is the increase in the critical current value of BSCCO with CH for increasing branch of I-V curve. The increase in width of hysteresis loops of I-V curves was interpreted as a kind of superheated state. We show in this study that the surface effects in superconductors can be studied by applying the reverse procedure in I-V curves. Finally, it is also shown that the macroscopic cylindrical hole act as a macroscopic pinning center for flux

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