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NONLOGARITHMIC MAGNETIZATION RELAXATION AT THE INITIAL TIME INTERVALS AND MAGNETIC FIELD DEPENDENCE OF THE FLUX CREEP RATE IN $Bi_2Sr_2Ca_ICu_2Ox$ SINGLE CRYSTALS.

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At the initial time intervals, preceding the thermally activated flux creep regime, fast nonlogarithmic relaxation is found. The full magnetic moment Pm(t) relaxation curve for T=77K, B∥c, B=8,92 mT is shown in Fig.I. The magnetic measurements were made using SQUID-magnetometer. Two different relaxation regimes exist. For $t<t_0 \sim I0^2 s$ the relaxation is almost exponentional as it is illustrated by the insert in Fig.I. Moreover, the Pm(0) value is determined only by the external magnetic field. For large times $t>t_0$ the well known logarithmic dependence appears. It is shown by solid lines in the lower insert Fig.2, T=77K, B∥c, B=4,23 mT for the curve I and B=8,92 mT for the curve 2. The nonlogarithmic relaxation for the initial time intervals may be related to the viscous Abrikosov vortices flow with $j>j_c$ for high enough temperature T and magnetic field induction B. This assumption correlates with our Pm(t) measurements. The characteristic time t_0 separating two different relaxation regimes decreasesas temperature and magnetic field are

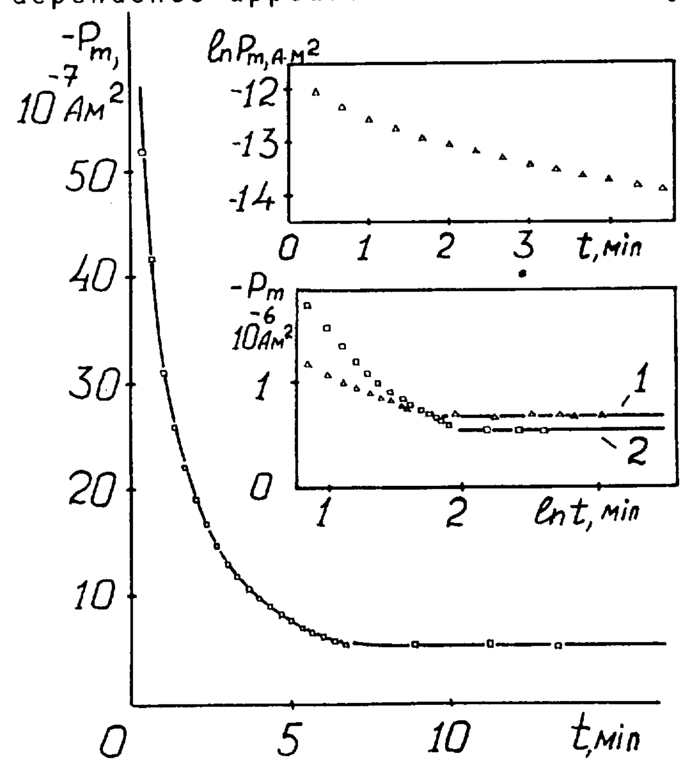

Fig.I

lowered. The logarithmic magnetization relaxation curves Pm(t) for fixed temperature T_0=50,0±0,IK and different external magnetic field inductions B are given in Fig.2. The B values are I-2,45 mT, 2 - 4,5I mT, 3-7,83 mT, 4-I3,84 mT, 5-I8,28 mT, 6-20,22 mT, 7-52 mT. The relaxation rate dependence on magnetic field, $R(B)=dPm(B,T_0)/d(\ln t)$ has a sharp maximum which is similar to that found for R(T) temperature dependences. The maximum shifts to lower fields as temperature goes up. The R(B) dependences for T_0=30K (curve I) and T_0=50K (curve 2) are shown in the insert in Fig.2. The observed sharp maximum is related to a topological transition in shielding critical current distribution and, consequently, in Abricosov vortices density. Taking into account the Anderson's thermally activated flux creep and the Abrikosov vortices distribution according to the Bean's model we have obtained curves shown in the insert in Fig.2 by solid lines.

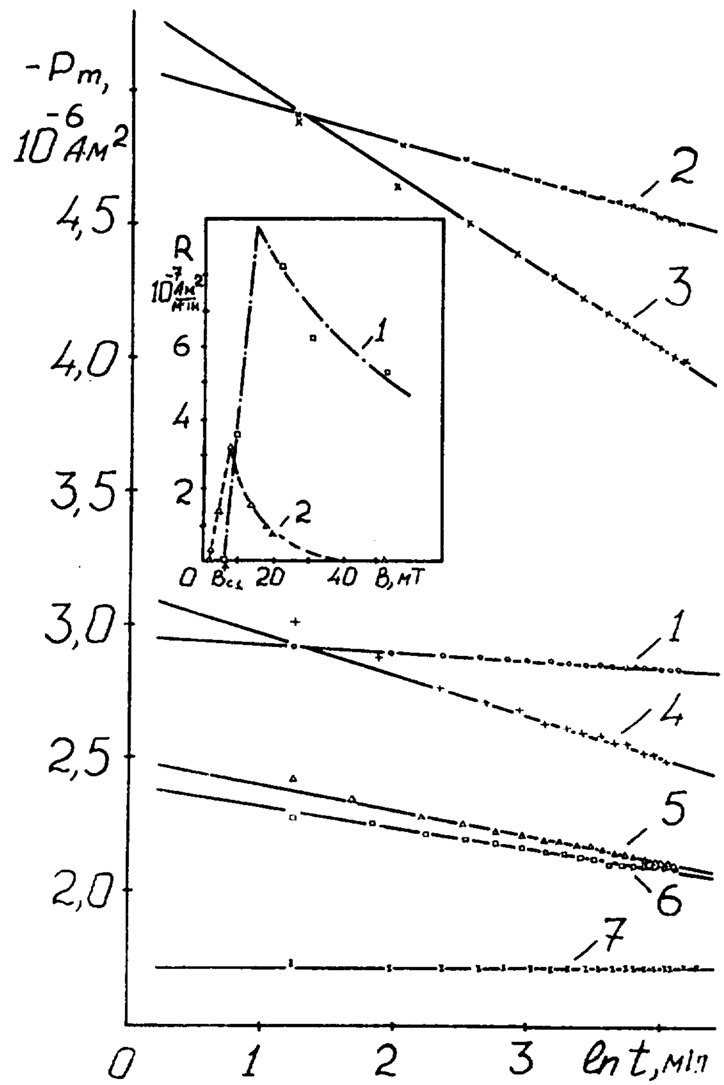

Fig.2

Summarizing, the nonlogarithmic magnetization relaxation for the initial time intervals is found. This fast relaxation has almost an exponentional character. The sharp relaxation rate R(B) maximum is observed. This maximum corresponds to a topological transition in Abrikosov vortices distribution.