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Observation of Sinusoidal Voltage Behaviour in Silver Doped YBCO ATILGAN ALTINKOK, Giresun University, Turkey, MURAT OLUTAS, KIVILCIM KILIC, ATILLA KILIC, Abant Izzet Baysal University — The influence of bi-directional square wave (BSW) current was investigated on the evolution of the $V - t$ curves at different periods (P), temperatures and external magnetic fields. It was observed that slow transport relaxation measurements result in regular sinusoidal voltage oscillations which were discussed mainly in terms of the dynamic competition between pinning and depinning. The symmetry in the voltage oscillations was attributed to the elastic coupling between the flux lines and the pinning centers along grain boundaries and partly inside the grains. This case was also correlated to the equality between flux entry and exit along the YBCO/Ag sample during regular oscillations. It was shown that the voltage oscillations can be described well by an empirical expression $V(t) \sim \sin(\omega t + \varphi)$. We found that the phase angle φ generally takes different values for the repetitive oscillations. Fast Fourier Transform analysis of the $V - t$ oscillations showed that the oscillation period is comparable to that (P_1) of the BSW current. This finding suggests a physical mechanism associated with charge density waves (CDWs), and, indeed, the weakly pinned flux line system in YBCO/Ag resembles the general behavior of CDWs. At certain values of P_1 , amplitude of BSW current, H and T , the YBCO/Ag sample behaves like a double-integrator, since it converts the BSW current to sinusoidal voltage oscillations in time.

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