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Manipulating vortex motion by thermal and Lorentz force in high temperature superconductors ZHI WANG, LEI SHAN, YINGZI ZHANG, FANG ZHOU, JIWU XIONG, WENXIN TI, HAI-HU WEN, Institute of Physics, Chinese Academy of Sciences, NATIONAL LAB FOR SUPERCONDUCTIVITY, INSTITUTE OF PHYSICS, CHINESE ACADEMY OF SCIENCES TEAM — By using thermal and Lorentz force, the vortex motion is successfully manipulated in the mixed state of $La_{2-x}Sr_xCuO_4$ single crystals and $YBa_2Cu_3O_7$ thin films. In the normal state, in order to reduce the dissipative contribution from the quasiparticle scattering and enhance the signal due to the possible vortex motion, a new measurement configuration is proposed. It is found that the in- plane Nernst signal (H || c) can be measurable up to a high temperature in the pseudogap region, while the Abrikorsov flux flow dissipation can only be measured up to T_c. This may point to different vortices below and above T_c if we attribute the strong Nernst signal in the pseudogap region to the vortex motion. Below Tc the dissipation is induced by the motion of the Abrikosov vortices. Above Tc the dissipation may be caused by the motion of the spontaneously generated vortex anti-vortex pairs.

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