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Vortex-glass transitions in Low-Tc superconductors JAVIER E. VILLEGAS, ELVIRA M. GONZALEZ, MARIA P. GONZALEZ, JOSE L. VICENT, Dpto. Fisica de Materiales, Facultad de Fisica, Universidad Complutense de Madrid, 28040 Madrid, Spain — We have measured I-V characteristics in the mixed state of superconducting plain Nb thin films, Nb thin films with artificial periodic arrays of magnetic pinning centers, and Nb/Cu superlattices. Using a scaling analysis of I-V characteristics, we have found clear evidence of a vortex-glass transition in those Low-Tc systems. Such glass transitions belong to the same universality than those earlier observed in High-Tc systems, since similar critical exponents have been found. We have studied the effect of the presence of periodic pining centers on the glass transition, the effect of the artificial anisotropy in the dimensionality on the glass transition of Nb/Cu superlattices, as compared to the behavior of Nb plain films. Among the most remarkable results, a dimensional crossover in the glass transition is found, from a three-dimensional VG transition in Nb films to a two-dimensional one in Nb/Cu superlattices.

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