

Thermally assisted flux flow and melting transition for Mo/Si multilayers

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Abstract

Two-dimensional and three-dimensional vortex-lattice melting is observed for superconducting Mo/Si multilayers. The position of the melting transition on the H-T phase diagram is in reasonable quantitative accordance with the existing theories. Above the melting line another phase transition is found connected with the decoupling in the liquid phase or with transition from hexatic to ordinary liquid. The thermally assisted flux-flow (TAFF) regime of the vortex motion is observed in the fluid phase governed by the plastic barrier characteristic for viscous liquid. The TAFF regime with different activation energy takes place also in a vortex solid phase above the depinning line.