Proximity effects in superconducting spin-valve structures

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Stellingen

behorende bij het proefschrift
Proximity effects in superconducting spin-valve structures

1. When magnetic domains appear in the superconducting spin-valve structure, they become the dominant factor in the working of the device.
   This thesis, chapters 4,5.

2. The suppression of superconductivity in the antiparallel state of a superconducting spin-valve with strongly spin-polarized magnetic banks may have an intrinsic origin, different from mechanisms involving stray fields.
   This thesis, chapter 5.

3. The low-energy muon spin resonance experiment is sensitive enough to establish the existence of magnetism on the superconducting side of a superconductor / ferromagnet interface.
   This thesis, chapter 6.

4. In a mesoscopic superconducting wire, a (new) transition mechanism to the normal state appears which is based on non-thermal quasiparticle distribution functions rather than on the (expected) thermodynamical critical current.
   This thesis, chapter 7.

5. The theoretical description of (thin film) S/F proximity systems stops at the point where their most intriguing property starts: the generation of (long range) triplet correlations. The experimental research is hindered by the fact that it is unclear how to translate the concept of a spin-active interface into an experimental realization.

6. Theory has yet to find a way to incorporate a two-spin-band model in a description of the superconducting proximity effect in ferromagnets.

7. In S/F proximity systems, the magnetic anisotropy of the ferromagnet is a small energy scale and does not receive much attention. However, it is perfectly capable in significantly changing the properties of the system, and therefore should be taken into consideration.

8. The almost standard usage of Green functions to describe the behavior of electrons in superconducting systems has created a large gap between experimentally and theoretically oriented researchers. A status quo is conveniently kept up by both sides.

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