

Seminář oddělení magnetik a supravodičů

Fyzikální ústav Akademie věd České republiky, v. v. i., Cukrovarnická 10, Praha 6

- ✓ Pondělí, **11. 7. 2011** ve **14:00** hod.
- ✓ Přednáškový sál u knihovny (budova A, 1. patro)

Excitation spectrum of well pinned vortex matter

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Abstract. Core excitations spectrum of the Abrikosov vortex pinned by a dielectric inclusion or nanohole of sizes of order of coherence length is considered using the Bogoliubov – de Gennes equations beyond semiclassical approximation. While the lowest excitation, minigap, in free (or pinned by a metallic defect) vortex is of order Δ^2/E_F , it becomes of the order of the superconducting gap Δ (E_F is Fermi energy). The reconstruction of the quasiparticle excitations' spectrum has a significant impact on optical properties and tunneling density of states. We calculate the absorption amplitude and point out that, while in STM the energy gap Δ_{DOS} is between a quasiparticle state with angular momentum $\mu^e = \mu_0 > 1/2$ and quasihole with $\mu^h = -\mu_0$, the microwave absorption gap, Δ_{dir} , is between the states with $\mu^e = \mu_{min} = \mu^h \pm 1$. It is shown $\Delta_{dir} > \Delta_{DOS}$.
