

# MAGNETIC PROPERTIES OF ALMOST LOCALIZED FERMIONS - REVISITED

J. Spałek<sup>a</sup> and W. Wójcik<sup>b</sup>

<sup>a</sup>Marian Smoluchowski Institute of Physics, Jagiellonian University,  
Reymonta 4, 30-059 Kraków, Poland

<sup>b</sup>Institute of Physics, Tadeusz Kościuszko Technical University,  
Podchorążych 1, 30-084 Kraków, Poland

The properties of almost localized fermions became a subject of a renewed interest in recent years. This is caused by the discovery of the spin-dependent heavy masses predicted some time ago [1] as well as of critical behavior near metal-insulator transition of the Mott-Hubbard type [2]. We discuss these properties within our earlier approach [3] and include the quantum Gaussian fluctuations. A strong metamagnetic behavior is connected to the spin-dependent masses. Effect of the orbital degeneracy on these effects is also briefly mentioned within an original rotationally invariant version of the extended Hubbard model containing the Hund's rule coupling.

[1] J. Spałek and P. Gopalan, Phys. Rev. Lett. **64**, 2823 (1990); P. Korbel et al., Phys. Rev. B **52**, R2213 (1995); R. Citro et al., Physica B **261**, 213 (1999).

[2] P. Limelette et al., Science **302**, 89 (2003).

[3] J. Spałek and W. Wójcik, in *Spectroscopy of the Mott Insulators and Correlated Metals*, Springer Tracts in Solid State Sciences **119**, pp. 41-65.

13.4 cm

## Subject category :

1. Correlated Electrons and High Temperature Superconductors

## Presentation mode :

invited

## Corresponding author :

J. Spałek

## Address for correspondence :

Marian Smoluchowski Institute of Physics, ul. Reymonta 4, 30-059 Kraków, Poland

## Email address :

ufspalek@if.uj.edu.pl

9.7 cm