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## Einladung zum Seminar

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### " New non-Goldstone mode observed in magnon BECe "

The superfluid  $^3\text{He}$  exhibits unusual magnetic properties which can be studied by the technique of nuclear magnetic resonance. The Homogeneously Precessing Domain (HPD) is one example of non-linear phenomena generated in superfluid B phase [1]. The HPD is characterized by coherent spin precession [2] conserved even in the case of non-homogeneous magnetic field. As was shown experimentally ([3], [4] and [5]), the HPD displays all features of spin superfluidity.

Furthermore, the HPD can be described as Bose-Einstein condensate of magnons [6] when the spontaneous occurrence of coherent spin precession is equivalent to the creation of coherent superfluid magnon condensate.

Moreover, the HPD is the state of dynamical equilibrium and therefore it can be excited by the application of additional perturbation. We observed a new excited mode of HPD [7] which can be described in the language of quantum field theory as a non-Goldstone mode excited in the Bose-Einstein condensate of magnons.

Literature:

- [1] A.S. Borovik-Romanov et al., JETP Lett. 40 (1984) 1033
- [2] I. A. Fomin, JETP Lett. 40 (1984) 1036
- [3] I. A. Fomin, Physica B 169 (1991) 153
- [4] Y. M. Bunkov, J. Low Temp. Phys. 135 (2004) 337
- [5] Spin Supercurrent and Novel Properties of NMR in  $^3\text{He}$ , Progress in Low Temp. Phys. 14 (ed. W. Halperin), Elsevier, (1995) 69
- [6] G. E. Volovik, J. Low Temp. Phys. 153 (2008) 266
- [7] M. Človečko, E. Gažo, M. Kupka, P. Skyba, Phys. Rev. Lett. 100 (2008) 155301

Host: S. Bühler-Paschen

**Dienstag, 15. September 2009, 11:00 Uhr**  
**Seminarraum 138B, 7. OG, Turm C (rot)**  
**Wiedner Hauptstraße 8-10**  
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