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Larmor diffraction and the relocation of the cold triple axis spectrometer FLEXX to MLZ

Tuesday, 25 June 2019 11:00 (30 minutes)

The cold triple-axis spectrometer (TAS) FLEXX at HZB is a well-designed and recently upgraded instrument [1-4]. There is a strong wish that this excellent instrument should be preserved for the community after shutdown of the HZB neutron source. One attractive gap in the present instrumentation suite, which could be filled by FLEXX, is the Larmor-diffraction technique [5-6] (LD) and, as a natural extension, cold neutron NRSE. LD permits the exact measurement of lattice constants and their distribution: the latter arising, for example, from internal strain, from a small splitting of Bragg peaks due to structural distortions or magnetostriction. In addition, spin correlation lengths in antiferromagnets and antiferromagnetic domain sizes of up to 1 μm can be determined with high accuracy. For looking at time-dependent processes one needs to switch to the NRSE mode.
The instrument will be placed on a cold neutron source. This will allow for a four-fold increase in Q resolution, as well as most importantly access to the low Q region, as compared to the existing TRISP@MLZ. Further, new developments are under way to allow for application of magnetic fields at the sample, hitherto not possible [7-9]. This opens up new vistas in the exploration of materials, magnetic or not. A last attractive gap to be filled within MLZ, is the possibility to combine high magnetic fields together with cold TAS.

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