

Overview about the plans and expectations for PETRA IV starting from the current status of 2 XAFS/XES beamlines at PETRA III

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Over the past 30 years X-ray absorption fine structure spectroscopy (XAFS) developed into an established analytical method used routinely by a large user community working in various fields of science. In parallel advanced spectroscopic methods based on XAFS and X-ray emission spectroscopy were developed and established. Today 2 beamlines at DESY's PETRA III storage ring are dedicated to XAFS and high resolved X-ray emission spectroscopy.

With the PETRA IV project DESY aims at building a diffraction limited 6 GeV storage ring. The electron beam optics layout is almost fixed and the currently planned beamline portfolio foresees 3 beamlines for XAFS and XES spectroscopy. One beamline will be dedicated to classical and quick scanning XAFS spectroscopy, one to high brilliance XAS and XES spectroscopy and one will allow truly simultaneous XAS spectroscopy and X-ray diffraction using the radiation from 2 independent undulators.

While the extremely high brilliance and degree of coherence at 4th generation storage ring sources offer unique possibilities for hitherto impossible experiments they pose some challenges for classical X-ray spectroscopy. The aim of this presentation will be to present the design and instrumentation of the planned future XAFS beamlines at PETRA IV and to discuss the experimental possibilities and possible problems for classical XAFS spectroscopy and advanced spectroscopic methods in comparison to the existing beamlines at PETRA III.