

# **Photoemission Cross Sections in the Valence Band Region -Their Importance for Achieving High Resolution in HAXPES-**

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Any further development of a new field like that of HAXPES needs basic information on fundamental data. The possibility to achieve ultimately spectroscopic resolution close to the Fermi edge in the meV range with volume sensitivity is challenging. Its applicability to materials of interest depends crucially on the expected count rates in the 10 keV range. The primary monochromatic intensities at third generation synchrotron sources are well known. The throughput of commercial and other electron spectrometers can be calculated with the help of electron optics programs. Much higher uncertainty is involved with the material parameters. Electron escape depth may be estimated with an uncertainty of 30%. It was, however, quite unclear at the outset to which extent cross sections in the valence band region can be induced with some confidence from atomic calculations. Measurements for the purpose of testing these assumptions have been performed at the ESRF up to 14.5 keV (C. Kunz et al. NIM A 547(2005)73 (Proc. of HAXPES 2003)) and at Spring 8 up to 10 keV (to be published) with different materials. At this moment the essential outcome is that, with the exception of the Au 6s electrons, atomic calculations are a good approximation within a factor of two for the valence band region in solids. Based on these facts an estimate of the count rates at 5meV resolution with spectroscopic arrangements for samples of interest will be given.