FIRST RESULTS WITH VERY HIGH RESOLUTION AND FLUX

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The High Energy Resolution Photoemission beamline, which has been constructed jointly by ISM-CNR and Sincrotrone Trieste ScpA, is available to users since September 95. The first experiments performed during the commissioning were dedicated to the determination of the monochromator resolution by means of gas-phase absorption spectra(1). Those spectra indicated that the resolving power was well above the specifications. Exploiting such exceptionally good resolution, we performed a detailed study of the surface versus bulk contribution of In 4d, Ga 3d and P 2p core levels in both InP(110) and GaP(110) (2).We also have taken photoemission spectra both at room temperature and at 90 K in order to investigate the role of defects in the broadening of the core lines. Our findings are in good agreement with the results of Cimino et al.(3) who recently found that the presence of defects on the surface of GaAs(110) may cause inhomogeneous Fermi level pinning and consequently an asymmetric broadening of the core lines. We also found, similarly to those authors, that this broadening can be removed by the Surface Photovoltage effect provided that the flat bands condition has been reached. The analysis of the core line shapes showed that the determination of parameters like the Lorentzian width and centroid and the spin-orbit doublet branching ratio is affected by the presence of this broadening.

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