# Grazing Incidence Fast Atom Diffraction: a new in situ technique to study the Molecular Beam Epitaxy growth

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We have discovered and developed an alternative technique to investigate the growth morphology of thin films, in situ and in real time, based on grazing incidence scattering of high energy atoms. This technique, named GIFAD for grazing incidence fast atom diffraction, uses the same geometry as reflection high energy electron diffraction but is less invasive, more surface sensitive, and readily interpretable quantitatively. In order to test it we have specially customized a molecular beam epitaxy (MBE) growth machine. I will present the basis of this new technique and the first results obtained for a semiconductor prototypical IIVI compound, ZnSe(001). Besides providing lattice parameter with high accuracy, we show that GIFAD gives straightforward access to the surface valence electron density profile, allowing clear identification of an electron transfer from Zn to Se. Also, the last results of surface and growth studies of GaAs epilayer with the new MBE GIFAD growth equipment will be presented.