The formation of surface structures with group III and IV metals adsorbed on (100) oriented noble metals has been traced back recently to the stabilization of CDWs. We have studied the case of Pb/Cu(100), which exhibits a phase transition from c(5√2x√2)R45º to c(2x2)(split) at 490 K. The formation of the first one is related to a gain in electronic energy.
The goal of this proposal was to investigate the structural changes related to this surface phase transition (Fig 1), previously characterized from the electronic structure point of view.

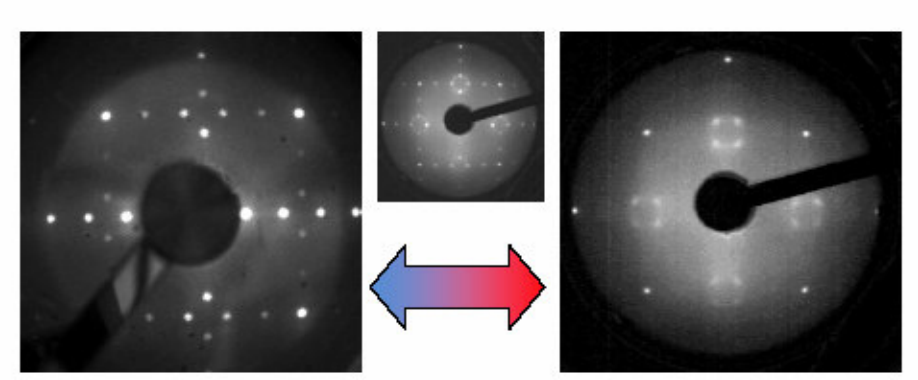

Figura 1*: LEED patterns at 85 eV primary energy for 0.6 ML OF Pb on Cu(100) at 300 K (left, c(5√2x√2)R45º phase), and at 450 K (right, split c(2x2) phase). The middle pattern corresponds to a temperature right on the transition edge where both phases coexist.*

Unfortunately, we could not arrive to get a good enough Cu(100) surface preparation due to technical problems with the annealing system implemented in the sample holder, which degassed too much and hindered a proper sample annealing in good pressure. Different sample holders were used, and after trying many different methods to sputter and anneal the sample and reach a reasonable surface quality, we arrived to the results in Fig 2, which shows a phi-scan for a minimum of the (0,-1) crystal truncation rod, more specifically (0,-1,0.2) phi-scan. From our previous experience with this sample, we concluded that the surface quality reached was insufficient use it, in spite of the good performance of the diffractometer and the rest of the beamline.

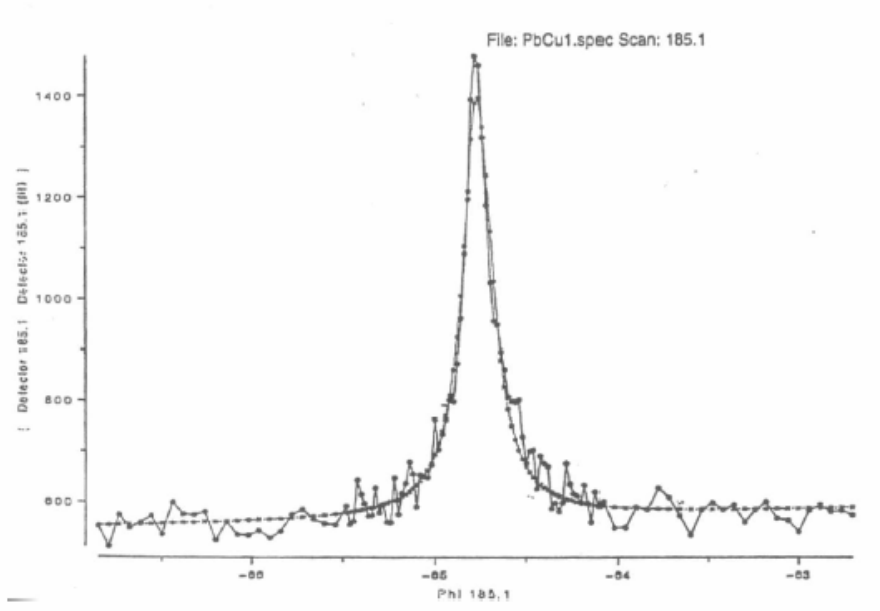

Figura 2*: Phiscan in the minimum of the (0,-1) crystal truncation rod*