High Brightness Photoinjector Simulations, J.L. COACOLO, INFN, Milano - To obtain a high brightness beam for the TESLA FEL project, operating in the VUV region, a Photoinjector providing a high quality beam is needed: ε_r Å 1 mm.rad, $\varepsilon_\gamma/\gamma$ Å 1%. The beam dynamics is simulated by the numerical code ATRAP, using the Liénard-Wiechert's equations to describe the self electromagnetic field. A brief description of this code and a study of the influence of the different parameters on the beam quality is presented. The available parameters are: the peak field on the cathode, the cavity cells number, the electrons distribution, etc. To confirm this results, a comparison with two others codes, ITACA and PARMELA, is shown.