Laser Acceleration of Particles at Ecole Polytechnique, F. AMIRANOFF, F. MOULIN, L.U.L.I.; D. BERNARD, F. JACQUET, P. MINE, A.E. SPECKA, L.P.N.H.E.; B. CROS, G. MATTHIEUSSENT, L.P.G.P.; P. MORA, C.P.H.T., J. MORILLO, S.E.S.I.; C. STENZ, G.R.E.M.I.; A. MODENA, Z. NASMUDIN, Imperial College - A relativistic electron plasma wave can produce longitudinal electric gradients of a few GV/m, which could be used to accelerate charged particles to ultra-high energy. A large amplitude plasma wave can be excited by the intensity modulations of a laser pulse, either by the beating of two laser pulses or by the wake-field of one single light pulse. We first review the results of the beatwave experiments performed at Ecole Polytechnique with a Nd:Yag laser. The creation of a large amplitude plasma wave by the electromagnetic beatwave in a fully ionized deuterium plasma and the saturation mechanisms of the wave were studied by resonant Thomson Scattering. Electrons injected at a 3 MeV total energy were accelerated with a gain up to 1.4 MeV, which was found to be compatible with a maximum gradient of 0.6 GV/m. The phase slippage of the low energy electrons with respect to the plasma wave is actually the limiting factor in the experiment. We finally present a wakefield experiment that is in preparation.