

**Observation of Laser Wakefield Acceleration of Electrons,**

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electrons injected in a plasma wave generated by the laser  
wakefield mechanism has been measured at Ecole  
Polytechnique. We have also observed a background noise  
faking high energy electrons, due to particles deflected in  
the plasma, in correlation with the electron plasma wave. A  
maximum energy gain of 1.6 MeV has been measured.  
The maximum longitudinal electric field is estimated to be  
1.5 GV/m. The experimental data agree well with  
theoretical predictions when 3D effects are taken into  
account. The duration of the plasma wave inferred from the  
number of accelerated electrons is of the order of 1 ps.