The formation of monoenergetic beams of accelerated electrons by focusing femtosecond laser radiation with an intensity of the order of $10^{17}\text{W/cm}^2$ onto the edge of aluminum foil was demonstrated in the experiments [1]. The electrons had energy distributions peaking in the 0.2 to 0.8 MeV range with a small energy spread about 20 percents.

The acceleration mechanism related to the generation of a plasma wave as a result of self-modulation instability of a laser pulse [2] in a dense plasma formed by a prepulse is considered. Three-dimensional PIC simulations of the laser pulse interaction with inhomogeneous plasma showed that effective excitation of a plasma wave as well as trapping and acceleration of an electron beam with an energy of the order of 1 MeV may occur in the presence of sharp gradients in plasma density and in the temporal shape of the pulse.

Under experimental conditions the inhomogeneities in the temporal envelope of the laser pulse may be caused by ionization nonlinearity of the plasma formed by the prepulse, and the spatial density inhomogeneities may be due to the sharp boundaries of the foil and the complex configuration of the plasma spread.