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Generation of high energy ions and electrons by the interaction of an intense laser pulse with plasmas HAE JUNE LEE, Pusan National University, MIN SUP HUR, Korea Electrotechnology Research Institute — High-energy ion beam generation from the interaction of an ultraintense femtosecond laser pulse with an overdense plasma slab combined with an underdense preplasma has been studied by using fully electromagnetic and relativistic particle-in-cell simulations. It was observed that the forward ion acceleration from the front and rear surfaces can be enhanced with a proper preplasma profile. The maximum and mean energy, the energy distribution functions of the accelerated ions, and Doppler shift of the reflected laser pulse are investigated with the variation of laser intensity, pulse duration, and preplasma profiles. In addition, the electron beam generation has been observed from the interaction of the laser pulse with underdense plasmas. Moreover, the effect of the obliquely incident laser pulse is analyzed and the possibility of X-ray generation is discussed.

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