Interaction of electromagnetic dominated outflows with inhomogeneous ambient medium

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The effect of background plasma on particle acceleration via Poynting fluxes, which may explain the effect of interstellar medium in γ-ray bursts and astronomical jets, is studied in 3D PIC simulation of electron-positron and ion-electron plasmas. When strongly magnetized plasma expands to background low-temperature electron-positron plasma, EM wave front accelerates background plasma and a low-density clump, and captures them in the Ponderomotive potential well. In electron-positron case, we do not observe any instability, and the momentum distribution of background and clump forms a power law of slope close to -1 with a sharp peak in the middle. In the ion-electron background and clump case, strong charge separation decelerates the wave propagation. Radiation spectrum and intensity profile from accelerated particles will be discussed.