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Beam-plasma interaction analyzed by a hybrid simulation code[1]
TOSHIHIRO TAGUCHI, Setsunan University, KUNIOKI MIMA, ILE, Osaka University — We have been developing an electromagnetic hybrid simulation code. In our hybrid code, beam electrons are described as PIC code, while background plasmas (electrons and ions) are described by fluid equations. Electromagnetic equations are fully solved. We have changed the fluid scheme from CIP (Cubic Interporated Pseudparticle) to CWENO (Central Weighted Essentially Non Oscillatory), which is one of conservative schemes. By using our new code, we have analyzed the problem of the fast electron transport propagating in an overdense region, which is very important for the fast ignition scheme in an inertial confinement fusion program. The fast electron beam is broken into a number of current filaments due to the transverse instability (Weibel instability). We will report about the scaling law of current filaments, their merging rate and the magnetic field generation. We will also report about the competition between the Weibel instability and a longitudinal two-stream instability. It is very interesting and important topics that which instability is dominant in the high density region.

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