

RECENT PROGRESSES IN RELATIVISTIC BEAM-PLASMA INSTABILITY THEORY

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Beam-plasma instabilities are a key physical process in many astrophysical phenomena. Within the fireball model of GRBs, they first mediate a relativistic collisionless shock before they produce upstream the turbulence needed for the Fermi acceleration process. While non-relativistic systems are usually governed by flow-aligned unstable modes, relativistic ones are likely to be dominated by normally (Weibel) or even obliquely propagating waves. After reviewing the basis of the theory, exact numerical results related to the relativistic kinetic regime of the poorly-known oblique unstable modes will be presented.