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Radiation from plasmas with sub-Larmor scale magnetic fields – generalized jitter radiation[1] MIKHAIL MEDVEDEV, University of Kansas — Radiation produced by relativistic electrons in random magnetic fields of a sub-Larmor scale is referred to as the jitter radiation. It has been predicted to be produced from high- energy density environments which naturally generate such fields via Weibel-type (e.g., streaming) instabilities. Thus, it was argued to be a new diagnostic of Weibel turbulence in relativistic collisionless shocks, in reconnection in electron- positron plasmas and in laser-produced plasmas, the latter is of interest to both laser-plasma applications (e.g., Fast Ignition) and to Laboratory Astrophysics. The spectral characteristics of jitter radiation are markedly different from those of synchrotron and carry information about the magnetic fields structure (e.g., its spatial spectrum). Conventional treatment of jitter radiation assumes negligibly small deflections of particles in the magnetic fields, which is not always the case. Here we relax this assumption and discuss the transition between jitter and synchrotron regimes. Although the full treatment is model-dependent, certain important conclusions can be drawn. We will also address applications to both laboratory studies of the Weibel turbulence and astrophysical phenomena.

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