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Theoretical aspects of jitter radiation from Weibel turbulence laboratory experiments.¹ S. REYNOLDS, S. POTHAPRAGADA, S. GRAHAM, M.V. MEDVEDEV, University of Kansas — Weibel instability development and structure is planned to be studied in Hercules and some other laboratory High-Energy Density experiments. In such experiments, a primary beam will induce current filamentation whereas the secondary beam can be used to probe the generated magnetic field structure. In particular, jitter radiation emitted by the electrons of the secondary beam in small-scale magnetic fields, can be used for accurate diagnostics. For this purpose, we further develop the theory of jitter radiation from magnetic fields generated by the Weibel instability and demonstrate that the spectra vary considerably with the viewing angle. Furthermore, we quantify how the low-energy photon index, α , ranges changes with the apparent viewing angle for various models of magnetic field spatial distribution. We discuss astrophysical applications of this study.

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