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Runaway positrons in magnetized plasmas T. FÜLÖP, G. PAPP, Department of Applied Physics, Nuclear Engineering, Chalmers University of Technology and Euratom-VR Association, Sweden — Runaway electron avalanches have been frequently observed in large tokamak disruptions. The energetic runaways produced in the avalanches may give rise to electron-positron pair production. It has been estimated that up to 10^{14} positrons may be created in collisions between runaway electrons and thermal particles in tokamak disruptions [1]. At birth, these positrons are highly relativistic, and either experience runaway acceleration or are thermalized in a few hundred milliseconds before being annihilated. In this work we calculate the distribution of positrons at birth and their subsequent fate in magnetized plasmas. The production rate is calculated by using a pair-production cross-section valid for arbitrary energies.

[1] P. Helander and D. Ward, Phys. Rev. Lett., 90 135004-1 (2003).

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