

Abstract Submitted  
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**Synchrotron emission diagnostic of full-orbit kinetic simulations of runaway electrons in tokamak plasmas**<sup>1</sup> LEOPOLDO CARBAJAL GOMEZ, DIEGO DEL-CASTILLO-NEGRETE, Oak Ridge National Lab — Developing avoidance or mitigation strategies of runaway electrons (RE) for the safe operation of ITER is imperative. Synchrotron radiation (SR) of RE is routinely used in current tokamak experiments to diagnose RE. We present the results of a newly developed camera diagnostic of SR for full-orbit kinetic simulations of RE in DIII-D-like plasmas that simultaneously includes: full-orbit effects, information of the spectral and angular distribution of SR of each electron, and basic geometric optics of a camera. We observe a strong dependence of the SR measured by the camera on the pitch angle distribution of RE, namely we find that crescent shapes of the SR on the camera pictures relate to RE distributions with small pitch angles, while ellipse shapes relate to distributions of RE with larger pitch angles. A weak dependence of the SR measured by the camera with the RE energy, value of the  $q$ -profile at the edge, and the chosen range of wavelengths is found. Furthermore, we observe that oversimplifying the angular distribution of the SR changes the synchrotron spectra and overestimates its amplitude.

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