

Abstract Submitted  
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**Light Recordings from Near-Earth Synchrotron Radiating Plasma Currents**<sup>1</sup> ANTHONY PERATT, Los Alamos National Laboratory, ALFRED QOYAWAYMA, Qoyawayma Plasmaceramics — Synchrotron radiation in the visible is produced by an intense particle beam (currents) in the presence of a magnetic field in the direction of relativistic electron acceleration. Among the properties of synchrotron radiation are: high brightness and high intensity many orders of magnitude more than X-rays; a high level of polarization (linear or elliptical); high collimation, i.e. small angular divergence of the beam; and high brilliance, exceeding other natural and artificial light sources by many orders of magnitude. For example, a brilliance larger than  $10^{18}$  photons/s/mm<sup>2</sup>/mrad<sup>2</sup> /0.1%BW, where 0.1%BW denotes a bandwidth  $1^{-3}\omega$  centered around frequency  $\omega$ . The properties of Birkeland currents from intense solar storms lasting decades but separated by millennia are: 56 pairs of currents (as in the penumbra of a dense plasma focus) enveloping the Earth on their passage through space. For the Earth, the electron flow is towards Antarctica. Both particle-in-cell simulations and man-made ground recordings indicate ground illumination of meter to decameter wide white lines fanning out at the poles [1,2].

[1] A. L. Peratt and W. F. Yao, *Physica Scripta* **T131**, October 2008

[2] P. Devereux and N. Pennick, "Lines on the Landscape," Robert Hale Ltd., London 1989.

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