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Local Environmental Characterization using Gamma Ground Survey Network MARC LITZ, DAVID BURNS, DIMOS KATSIS, JAMES CARROLL, Army Research Laboratory — Inexpensive gamma detectors with GPS and wireless communications have been developed and installed to provide a ground survey network for detection of environmental levels of gamma radiation from naturally occurring events (i.e. radon, lightening, solar flares, etc.) and unintended gamma radiation on the battlefield and along transport routes. Signals from lightening and cosmic rays have pulse widths less than 100 us. Pedestrian borne and vehicle borne radiation sources have signatures from millseconds to seconds. The large energy associated with solar initiated disruptions (10^{20}J) generates a variety of ground level events that can last for hours. Data collected during the 24/7 operation of this gamma network is compared to xray, electron, and ion flux from satellite sensors. Local rainfall data is also utilized to make comparisons to local radon intensity levels. This paper will discuss the time and intensity correlations with corroborating environmental data. If the gamma signals characteristics from local environments and space-based environments can be described with enough detail, it is hoped that automated warning of unexpected radiation events can offer early warning protection to power and energy grid avoiding potentially damaging surges as well as offer local radiation health warning as necessary.

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