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Terrestrial gamma-ray flashes (TGFs) are bursts of high-energy photons originating from the Earth's atmosphere in association with thunderstorm activity [e.g., *Briggs et al.*, JGR, 118, 3805, 2013]. TGFs are associated with initial propagation stages of intracloud lightning, which represent the most frequent type of lightning discharges [e.g., *Cummer et al.*, GRL, 42, 7792, 2015, and references therein]. TGFs are known to be produced inside common thunderclouds [e.g., *Splitt et al.*, JGR, 115, A00E38, 2010] typically at altitudes ranging from 10 to 14 km [e.g., *Cummer et al.*, GRL, 41, 8586, 2014]. The global TGF occurrence rate is estimated to be 400,000 per year concerning TGFs detectable by Fermi-GBM (Gamma ray Burst Monitor) [*Briggs et al.*, 2013], but detailed analysis of satellite measurements [*Østgaard et al.*, JGR, 117, A03327, 2012] and theoretical studies [*Celestin et al.*, JGR, 120, 10712, 2015] suggest that it cannot be excluded that TGFs represent a part of a regular process taking place during the propagation of lightning discharges.

It is important to assess the risk induced by TGFs for airline passengers and crews on board aircraft approaching thunderstorms. *Dwyer et al.* [JGR, 115, D09206, 2010] have estimated that if an aircraft were to find itself in the source electron beam giving rise to a TGF, passengers and crews might receive effective radiation doses above the regulatory limit depending on the beam diameter. Moreover, *Tavani et al.* [Nat. Hazards Earth Syst. Sci., 13, 1127, 2013] concluded that TGF-associated neutrons produced by photonuclear reactions would cause serious hazard on the aircraft avionics. In this work, we will present detailed simulation-based estimations of effective doses received by humans that would be irradiated by TGFs for various production altitudes and distances from the TGF source.