



First simultaneous observations of optical lightning and terrestrial gamma flash from space

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We present the very first simultaneous detection of a terrestrial gamma-ray flash (TGF) and the optical signal from lightning. By fortuitous coincidence two independent satellites passed less than 300 km from the thunderstorm system that produced a TGF that lasted 70 μ s. Together with two independent measurements of radio emissions we have an unprecedented coverage of the event. We find that the TGF was produced 'deep' in the thundercloud at the initial stage of an intracloud (IC) lightning before the leader reached the cloud top and extended horizontally. A strong radio pulse was produced by the TGF itself. This is the first time the sequence of radio pulses, TGF and optical emissions has been identified.