



Search for gamma ray signatures from +IC upward leaders.

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In March-May 2017 the "GOES-R Validation Flight Campaign" on the basis of an ER-2 aircraft was undertaken over the United States. One of the scientific goals was observation of energetic gamma ray emissions from lightnings and thunderstorm systems at 20 km altitude. The instrumental payload was capable to record optical signals, fast and slow electric fields, and detect energetic photons. There were performed 16 flights over the continental part of the USA, of a total duration of about 70 flight hours at a cruise altitude of about 20 km. About 45 flight hours were over active thunderstorm regions.

In this work we present an identification algorithm of upward moving in-cloud negative stepped leaders (+IC) based on the analyses of the fast and slow electric field measurements combined with the optical signals from lightnings in the field of view of the on-board instruments. Identified +IC candidates allow the reasonable inspection of the gamma ray recordings compared to a blind search for gamma ray signatures.