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## Observation of a Terrestrial Electron Beam during the tropical cyclone Joania in March 2019

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Terrestrial Gamma-ray Flashes (TGFs) are short (~20 us to ~2 ms) flashes of high energy (< 40 MeV) photons, produced by thunderstorms. When interacting with the atmosphere, the TGF's photons produce relativistic electrons and positrons at higher altitudes, and a fraction is able to escape the atmosphere [1,2,3]. The electrons/positrons are then bounded to Earth's magnetic field lines and can travel large distances inside the ionosphere and the magnetosphere. This phenomenon is called a Terrestrial Electron Beam (TEB).

The Atmosphere-Space Interactions Monitor (ASIM), dedicated to the study of TGF and associated events, started to operate in June 2018. ASIM contains an optical instrument (MMIA) made of micro-cameras and photometers, as well the Modular X and Gamma-ray Sensor (MXGS) for high energy radiation. MXGS is composed of the low energy detector (LED, 50 keV to 400 keV) and the High Energy detector (HED, 300 keV to 40 MeV).

This presentation is focused on a new event which was detected on March 24, 2019. The TEB originated from rainbands produced by the tropical cyclone Joania, in the Indian Ocean, close to Madagascar. This observation shows, for the first time to our knowledge: (1) the low energy part (>50 keV) of the TEB spectrum, using the LED, (2) an estimate of the incoming direction (to ISS) of the electron Beam from recorded data.

### References:

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