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Comment on angeo-2021-26

Anonymous Referee #2

Referee comment on "Space weather study through analysis of solar radio bursts detected by a single-station CALLISTO spectrometer" by Theogene Ndacyayisenga et al., Ann. Geophys. Discuss., https://doi.org/10.5194/angeo-2021-26-RC2, 2021

Referee report ANGEO, Ndacyayisenga et al.: Space Weather Study through Analysis of Solar Radio Bursts detected by a Single Station CALLSTO Spectrometer

The paper summarizes the results of the first year of observations with an e-CALLISTO radiospectrograph at Kigali, Rwanda. It gives lists of the obsetrved radio bursts, briefly discusses some statistics, and attempts to draw a few concluions. The main problem with the paper is that the analysis and interpretation of the events is quite superficial. No qualitatively new results are obtained. I see two options: some more in-depth analysis, in particular putting elaborating on the statistical results and putting them into context of existing work, and/or focusing more on the technical and operational aspect, e.g. by demonstrating why this e-CALLISTO station is a valuable addition to the network. I have addressed particular issues below.

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Major issues:

Comparison to existing event catalogs:
In assessing the performance of the instrument, it would be very instructive to compare the number of detected bursts with existing event catalogs. Radio bursts are available from the NOAA Space Weather Prediction Center at least for the second half of 2015 (ftp://ftp.swpc.noaa.gov/pub/indices/events/), so a partial comparison coiuld be done. Such a discussion would significantly strengthen the case of the paper.

Type IV bursts, shocks, and CMEs (line 79 & 114):
While the association of type IV bursts with CMEs is high, the claim that they are caused

by CME-driven shocks is erroneous. It is well established that type IV bursts are generated by energetic electrons trapped in a magnetic structure, e.g. an erupting flux rope in the framework of a CME. This error has to be corrected.

Conclusions:
The conclusions are quite weak. The fact that all type II bursts were flare-associated does not add any useful information on their origin, given that they were all associated to CMEs as well.

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Minor issues:

Sect. 2:
Technical details of the Callisto system as implemented in Rwanda should be given, including temporal and frequency resolution and antenna characteristisc.

Tables:
How is the CME onset time defined?

line 82: It is said that a specific type II burst is chosen for its geo-effectiveness. It is more appropritate to say that it was chosen because it was associated to a geo-effective event, since a coronal shock by itself is not geo-effective.

line 97: It is claimed that outward-propagating waves are associated with the bursts. The statement is at odds with the next sentence that associates type III bursts with jets. A jet is not a wave, so please clarify thiss issue.

line 102: Not clear to me what the authors want to say here - please rephrase.

lines 109-112: It should be noted that the latitudinal distribution of type III-asociated flares is not surprising, as it just reflects the distribution of flares (and active regions) in general.

lines 126 & 127 (and potentially other places: When referring to the instrument please use "spectrometer" instead of spectrogram