



Interactive
Comment

Interactive comment on “Comment on “Comparative study on earthquake and ground based transmitter induced radiation belt electron precipitation at middle latitude” by Sideropoulos et al. (2011)” by J.-A. Sauvaud et al.

R. SELESNICK (Referee)

rselesnick@gmail.com

Received and published: 2 August 2013

This report/comment presents convincing evidence that some electron precipitation bursts measured on the DEMETER satellite, previously interpreted by Sideropoulos et al. as earthquake precursors, result instead from resonant scattering by VLF waves originating at ground-based radio transmitters. It should be published as a counterpoint to the earlier reports. It raises an obvious question (that perhaps should be stated explicitly in the text): Can precipitation bursts ever be uniquely identified as earthquake

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



precursors?

The authors state at the beginning that "many, if not all," of the bursts under consideration here should be attributed to VLF transmissions instead of earthquakes. Later they say simply that "all are due" to VLF transmissions. It is important that a more consistent and clear statement be made. Perhaps something like: all burst are consistent with being caused by ground transmitters. As they mention, if there is a possible interpretation other than earthquakes then it should be carefully considered.

The energy-dispersed wisp signatures are clear evidence of transmitter origin, especially those from NWC. The argument based on geographic and UT distributions in Figure 9 is less clear, but still significant. That VLF transmissions are nearly continuous, from many locations, whereas large earthquakes occur only occasionally, places a heavy burden of justification on any interpretation of electron bursts favoring earthquakes.

One technical point that is unclear is whether the authors accounted for drift time between the transmitters and the satellite longitude. For example, in discussing Figure 4b, NWC must be in daylight at the time electrons would have left the NWC longitude in order for the wisp not to be present. This can be up to a few hours earlier than the time they would have reached the satellite. This point should be clarified in the text.

Finally, since DEMETER's primary mission was to search for VLF waves associated with earthquakes, it may be worth mentioning in the introduction whether any such signals have been observed.

[Several typos and grammatical errors should be corrected:

p.3555 wisp features -> wisp feature

p.3556 on east of NWC -> east of NWC; energy dispersion -> energy dispersed

p.3559 dispersed electron dispersed structure -> dispersed electron structure; Before to claim -> before claiming

p.3560 Europa -> Europe; indicating of a probably -> indicating a probably; Fig 8 -> Fig

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



9 (line 27)

p.3561 supposed that -> suppose that; Fig 8 -> Fig 9 (line 9); Europa does -> Europe do]

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 3553, 2013.

NHESSD

1, C738–C740, 2013

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

C740

