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**Publication date**

2021

**Document Version**

Final published version

**Published in**

The astronomer's telegram

[Link to publication](#)

**Citation for published version (APA):**

Kirsten, F., Eijnden, J. V. D., Snelders, M., Nimmo, K., Hessels, J., Gawronski, M., Yang, J., & Feiler, R. (2021). Upper limits on the radio fluence of the most recent X-ray bursts from SGR1935+2154. *The astronomer's telegram*, 14382. <https://www.astronomerstelegram.org/?read=14382>

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## Upper limits on the radio fluence of the most recent X-ray bursts from SGR1935+2154

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on 9 Feb 2021; 20:50 UT

Credential Certification: *Franz Kirsten (franz.kirsten@chalmers.se)*

Subjects: Radio, Transient, Fast Radio Burst, Magnetar

Referred to by ATel #: [14395](#)

### Tweet

All of Fermi GBM, Konus Wind, GECAM, and Swift-BAT reported several bright bursts during the recent X-ray activity of SGR1935+2154 (GCN circulars GCN #[29363](#), #[29365](#), #[29373](#), #[29374](#), #[29388](#) and ATel #[14359](#)). We were observing the source at multiple radio frequencies during the following bursts:

29 Jan 2021 07:00:00.99 UTC (ATel #[14359](#), GCN #[29373](#))

29 Jan 2021 10:35:39.94 UTC (ATel #[14359](#))

29 Jan 2021 15:23:29.92 UTC (ATel #[14359](#))

02 Feb 2021 12:54:27.00 UTC (GCN #[29388](#))

During the three bursts on 29 Jan 2021 we observed with the Westerbork (Wb) single 25-m dish RT1 (P-band, 300.0-364.0 MHz) and the Onsala (O8) 25-m telescope (L-band, 1360-1488 MHz). On 2 Feb 2021 we observed also with the Torun 32-m telescope (C-band, 4550-4806 MHz) in addition to Wb and O8.

We used a custom built pipeline to search the baseband recordings. This pipeline first creates channelised filterbank files (Stokes I) which are then searched for bursts with Heimdall (using the DM-range  $332.7 \pm 50$  pc/cm<sup>3</sup>). Potential candidates are classified with FETCH (Agarwal et al. 2020). Neither the automated pipeline nor a manual search around -10/+30 seconds of the reported X-ray burst times lead to a detection. Thus we can constrain the fluence of any potential bursts coincident with the X-ray bursts to be

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lower than 78 Jy ms, 8 Jy ms and 3 Jy ms at P-, L-, and C-band, respectively (7-sigma detection threshold for the automated pipeline).

We also performed a preliminary analysis of the overlapping Fermi/GBM bursts on 29 Jan 2021. We find that the spectral parameters, when fitting each burst with a double blackbody model, are consistent with typical X-ray bursts seen from SGR 1935+2154 (Lin et al. 2020). They are, on the contrary, not consistent with the spectrum seen during the anomalous, hard X-ray burst with contemporaneous radio burst emission (Mereghetti et al. 2020). The same holds for the spectral parameters reported for the 02 Feb 2021 Fermi/GBM bursts (GCN #29388). The fluences of all four X-ray bursts are similar to that of the anomalous, hard X-ray burst; if a contemporaneous radio burst of similar fluence (1.5 MJy ms; Bochenek et al. 2020) had occurred, it would have been detected given our sensitivity.

We also observed the source during the following times

30 Jan 2021 0530-1245 UTC

31 Jan 2021 0530-1045 UTC

01 Feb 2021 0515-1345 UTC

02 Feb 2021 0430-1800 UTC

03 Feb 2021 0430-1800 UTC

No radio bursts have been found as of yet. We will continue to monitor the source regularly.

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