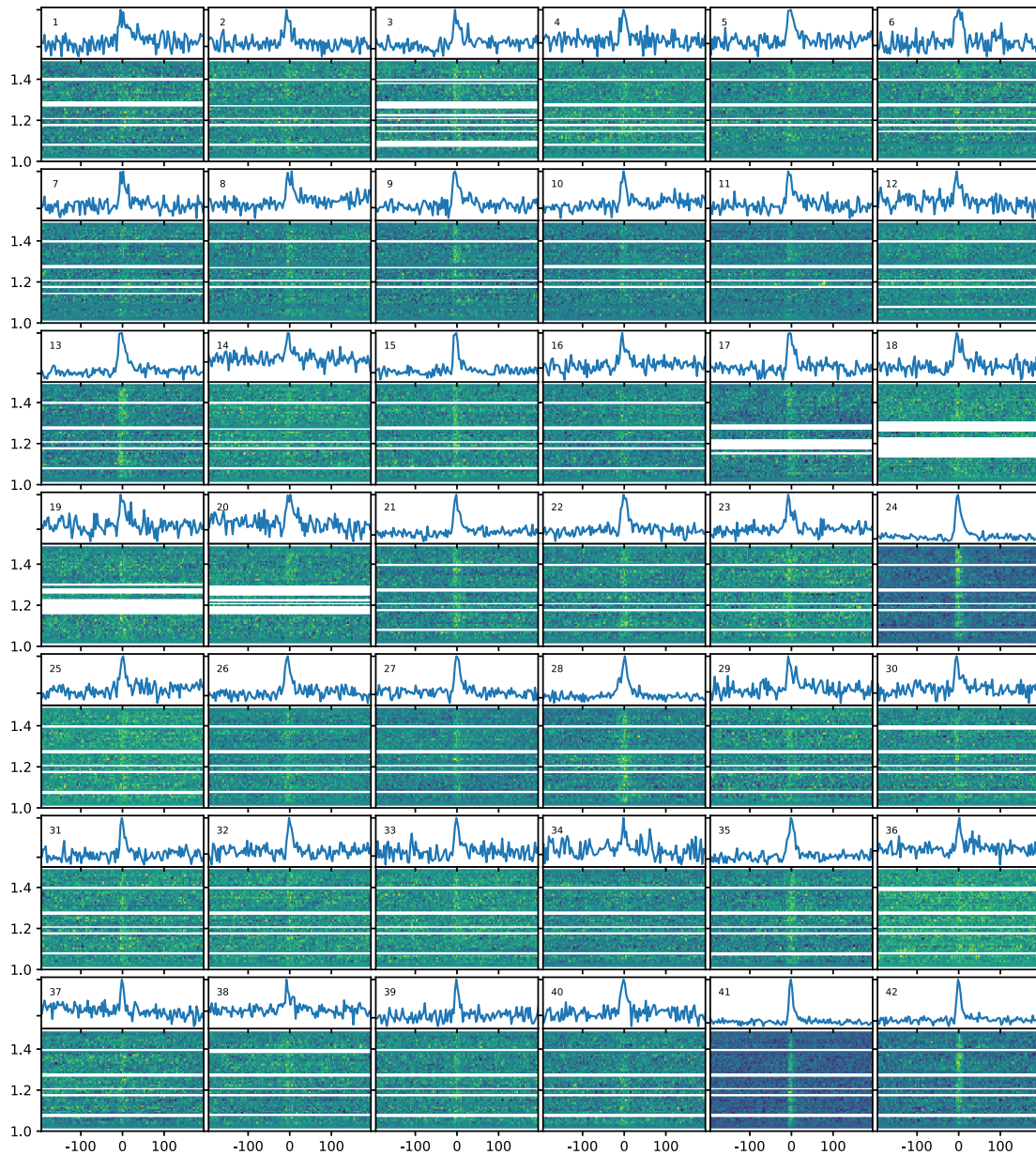
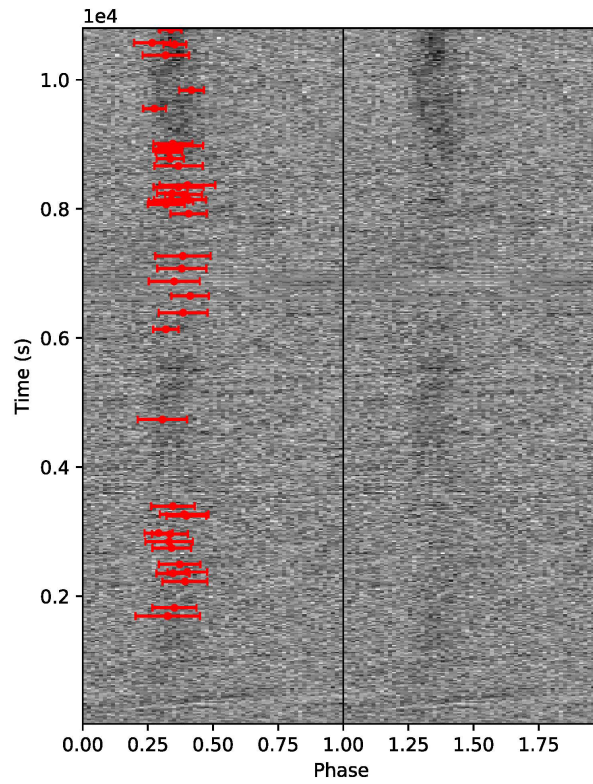




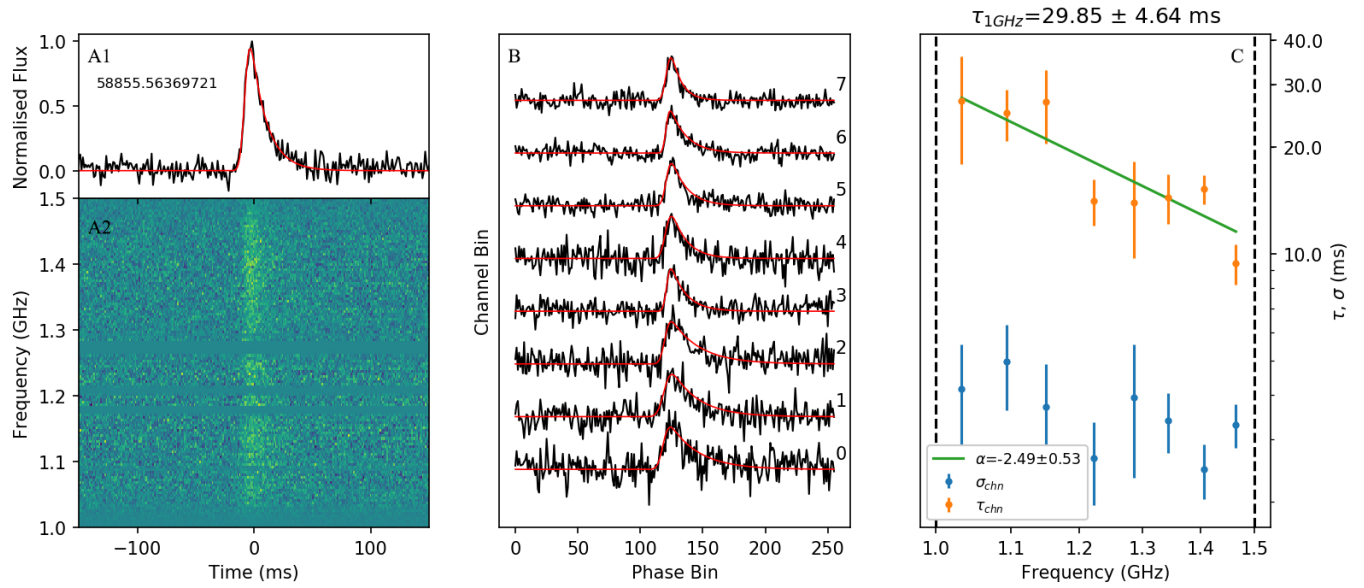
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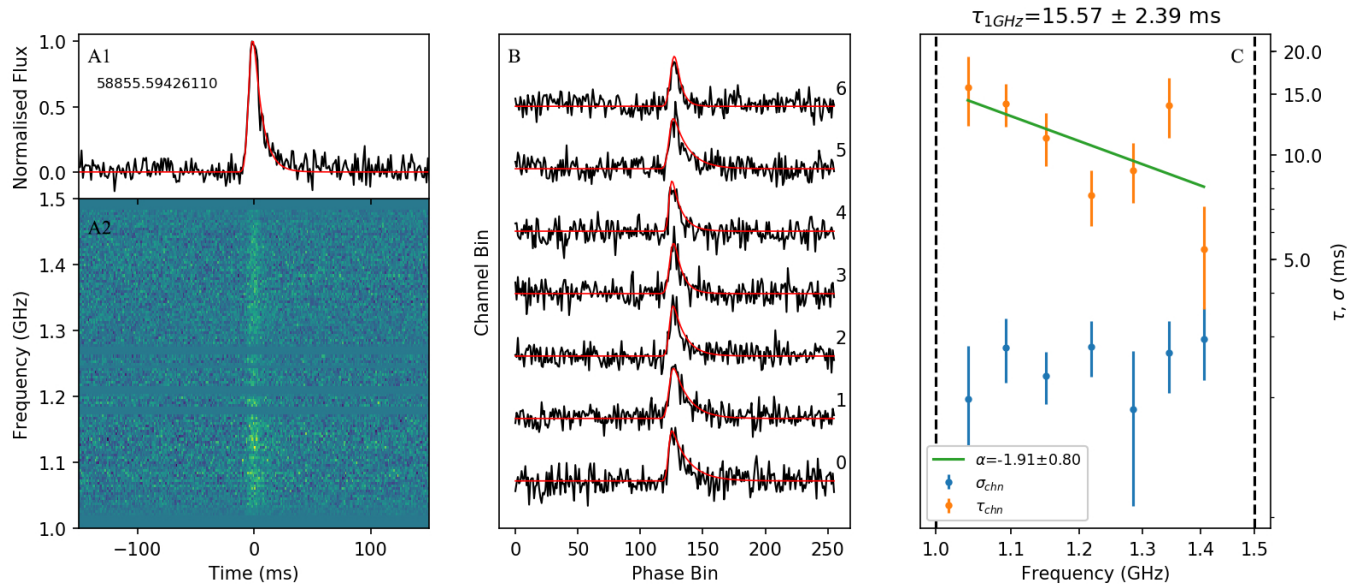
**Supplementary Figure 2:** Single pulses detected in the *FAST* data for 2020 January 7<sup>th</sup>. The pulse profile and the dynamical spectrum are shown for each single pulse. The burst number corresponding to the burst number in Extended Data Table 2 are given in each panel. White strips in the dynamical spectra indicate the RFI zapping. The profile of the single pulse varies from each other, as is commonly found in other pulsars.



**Supplementary Figure 3:** The intensity versus the pulse phase and the observational time. The red bars mark the pulse phase and the occurrence time of the single pulses having a S/N ratio larger than 7.



**Supplementary Figure 4:** Pulse No. 24. **A1** and **A2** show the pulse profile and dynamical spectra, respectively. **B:** fitting of sub-band profile which with  $S/N \geq 7$ . **C:** scattering timescales as a function of frequency. The fitting parameters  $\alpha$ ,  $\sigma_{chn}$ ,  $\tau_{chn}$  and their  $1\sigma$  errors are plotted.



**Supplementary Figure 5:** Pulse No. 41. **A1** and **A2** show the pulse profile and dynamical spectra, respectively. **B:** fitting of sub-band profile which with  $S/N \geq 7$ . **C:** scattering timescales as a function of frequency. The fitting parameters  $\alpha$ ,  $\sigma_{chn}$ ,  $\tau_{chn}$  and their  $1\sigma$  errors are plotted.

**Supplementary Table 2: Parameters of single pulses**

Burst No.	Barycentric TOA	$DM_{s/n}/\text{pc cm}^{-3}$	Pulse Width/ms	$S_{\text{mean}}/\text{mJy}$	SNR
1	58855.48912132	$239.7\pm 6.0$	$33.30\pm 2.15$	4	12
2	58855.49060114	$239.5\pm 4.1$	$22.79\pm 2.70$	5	12
3	58855.49533330	$239.8\pm 3.3$	$23.18\pm 2.29$	6	15
4	58855.49677862	$243.0\pm 3.4$	$17.07\pm 2.13$	5	11
5	58855.49701244	$240.4\pm 3.0$	$20.55\pm 2.03$	6	15
6	58855.49838616	$236.9\pm 4.2$	$21.45\pm 2.80$	5	11
7	58855.50132061	$243.1\pm 3.6$	$19.95\pm 2.21$	5	12
8	58855.50245141	$242.5\pm 3.8$	$24.58\pm 2.57$	5	14
9	58855.50381590	$242.0\pm 2.5$	$18.57\pm 1.59$	7	16
10	58855.50399956	$240.3\pm 2.4$	$14.48\pm 1.57$	7	13
11	58855.50708709	$245.9\pm 3.2$	$20.70\pm 2.09$	6	14
12	58855.50738301	$235.2\pm 5.4$	$25.07\pm 3.64$	4	10
13	58855.50881900	$242.5\pm 1.9$	$22.48\pm 1.27$	11	26
14	58855.52436392	$243.5\pm 6.1$	$25.48\pm 4.27$	4	9
15	58855.54052275	$238.1\pm 1.3$	$13.12\pm 0.86$	12	22
16	58855.54351360	$237.8\pm 4.6$	$25.29\pm 2.97$	5	12
17	58855.54650744	$238.6\pm 2.3$	$19.32\pm 1.53$	8	18
18	58855.54912095	$241.7\pm 4.1$	$26.37\pm 2.72$	5	14
19	58855.55143568	$237.9\pm 5.0$	$25.29\pm 3.28$	4	11
20	58855.55369114	$240.0\pm 5.6$	$28.58\pm 3.60$	4	11
21	58855.56126751	$237.4\pm 1.8$	$18.69\pm 1.21$	10	22
22	58855.56294326	$242.0\pm 2.3$	$19.02\pm 1.42$	8	18
23	58855.56346356	$240.1\pm 2.9$	$22.91\pm 1.89$	7	17
24	58855.56369721	$240.7\pm 1.9$	$37.82\pm 2.03$	14	44
25	58855.56375349	$241.3\pm 2.8$	$18.31\pm 1.79$	7	14
26	58855.56468178	$240.0\pm 2.3$	$18.99\pm 1.52$	8	18
27	58855.56491529	$239.2\pm 1.8$	$15.67\pm 1.16$	10	19
28	58855.56603998	$238.5\pm 1.9$	$25.93\pm 1.25$	11	29
29	58855.56637341	$237.8\pm 5.2$	$28.66\pm 3.18$	4	12
30	58855.56981879	$236.1\pm 4.5$	$24.94\pm 2.89$	5	12
31	58855.57110841	$239.3\pm 2.2$	$14.01\pm 1.49$	7	14
32	58855.57231400	$243.0\pm 2.5$	$13.70\pm 1.56$	6	12
33	58855.57289030	$241.2\pm 2.6$	$14.30\pm 1.73$	6	12
34	58855.57346368	$241.7\pm 6.3$	$23.11\pm 4.65$	3	8
35	58855.57381872	$241.9\pm 1.9$	$20.17\pm 1.25$	10	23
36	58855.58009888	$239.4\pm 2.5$	$11.75\pm 1.58$	6	10
37	58855.58342643	$239.5\pm 2.5$	$12.78\pm 1.72$	6	11
38	58855.58968159	$239.1\pm 4.7$	$24.03\pm 3.20$	4	11
39	58855.59161939	$240.1\pm 2.0$	$11.78\pm 1.29$	7	13
40	58855.59189638	$240.5\pm 3.1$	$18.71\pm 1.98$	6	13
41	58855.59426110	$240.5\pm 1.0$	$20.60\pm 1.19$	20	46
42	58855.59444177	$241.1\pm 0.9$	$11.56\pm 0.56$	16	28

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