Microburst Time of Flight Dispersion

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Inverse dispersed microbursts

Hypothesized by a time of flight model in Miyoshi et al., (2010) and Saito et al., (2012)

I stumbled into them. Surprisingly I did not find them when I looked for them in ~2016.

I identified microbursts using the burst parameter and fit all of the microbursts with a Gaussian + linear trend.

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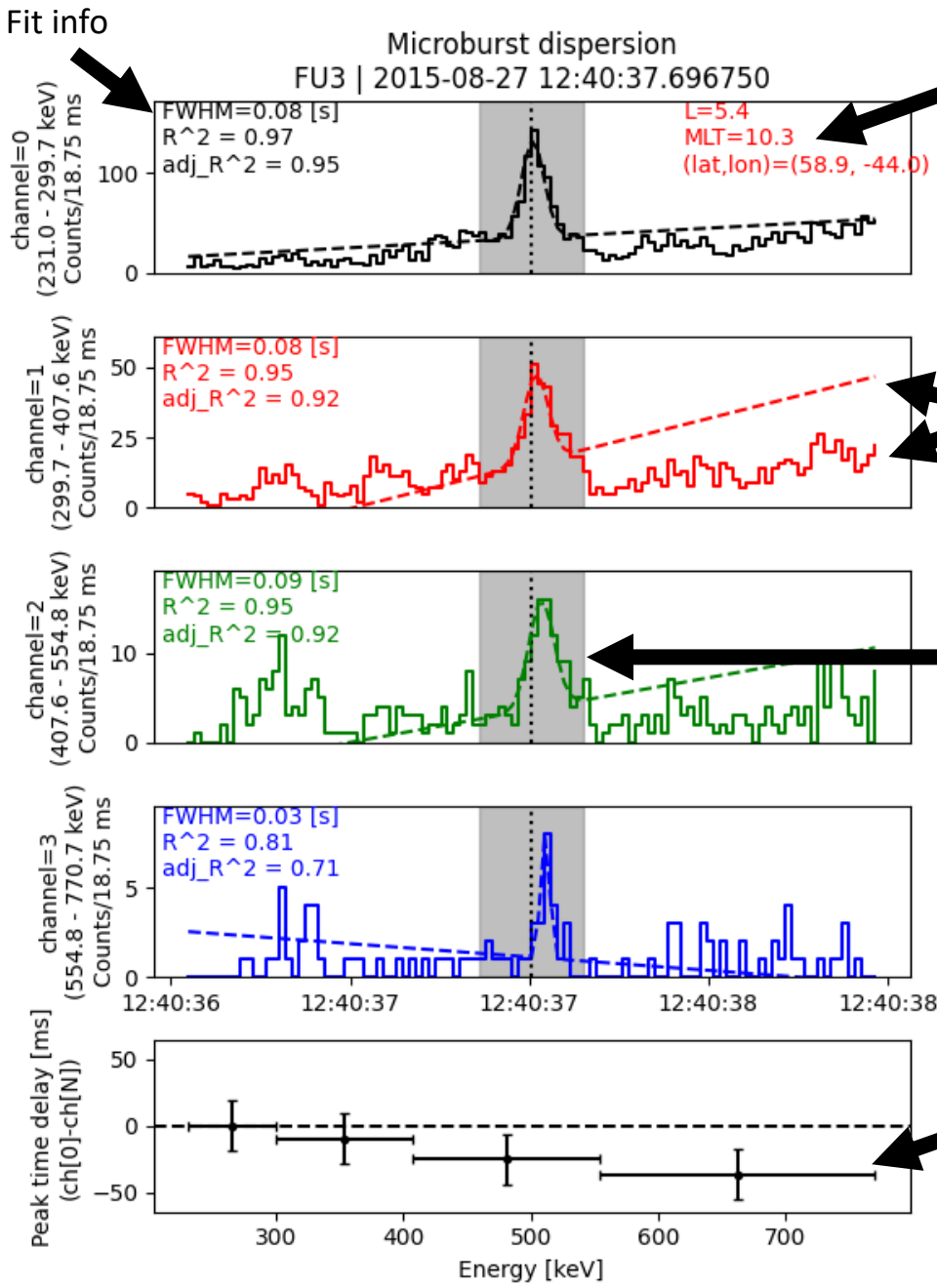
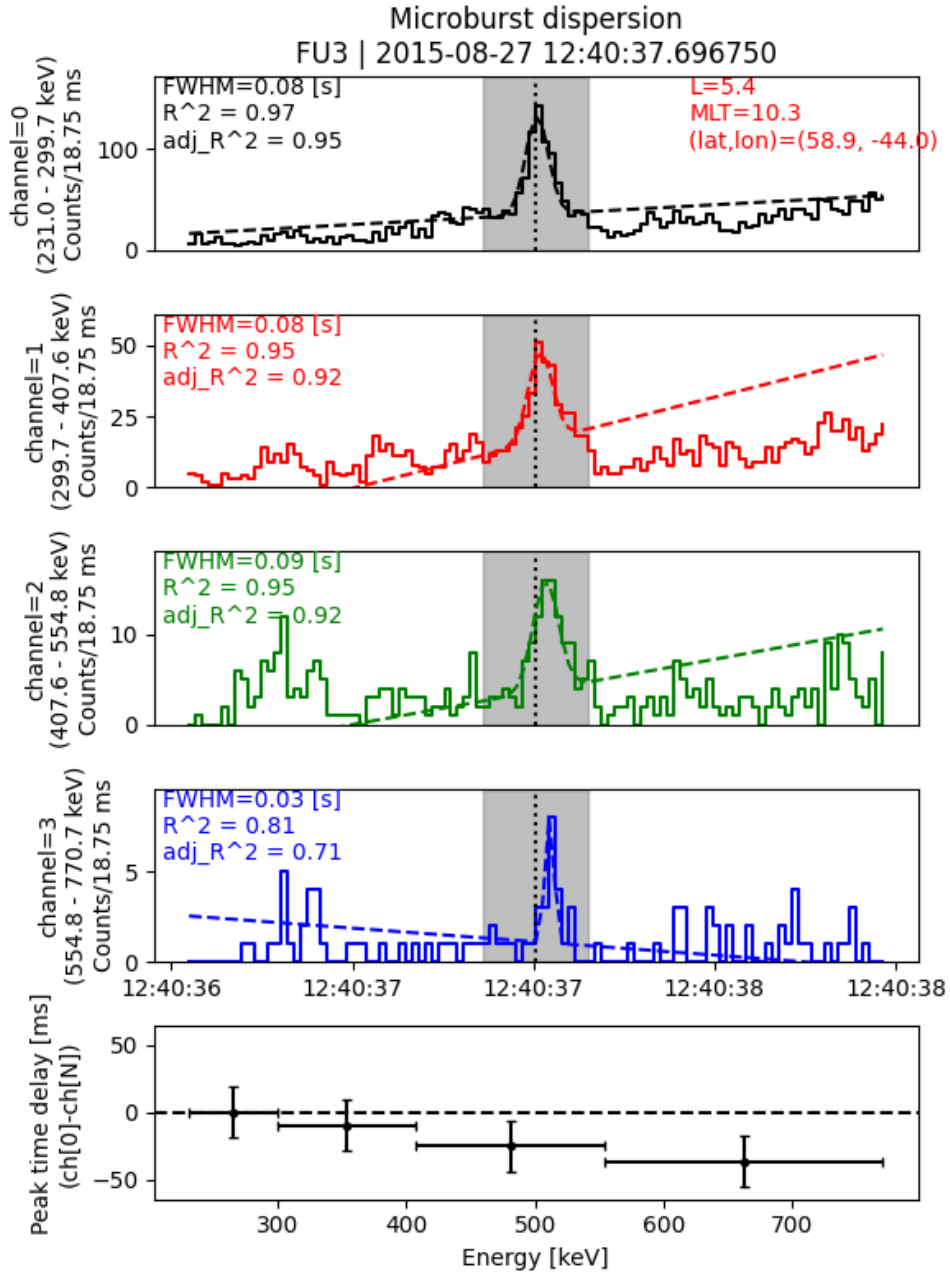
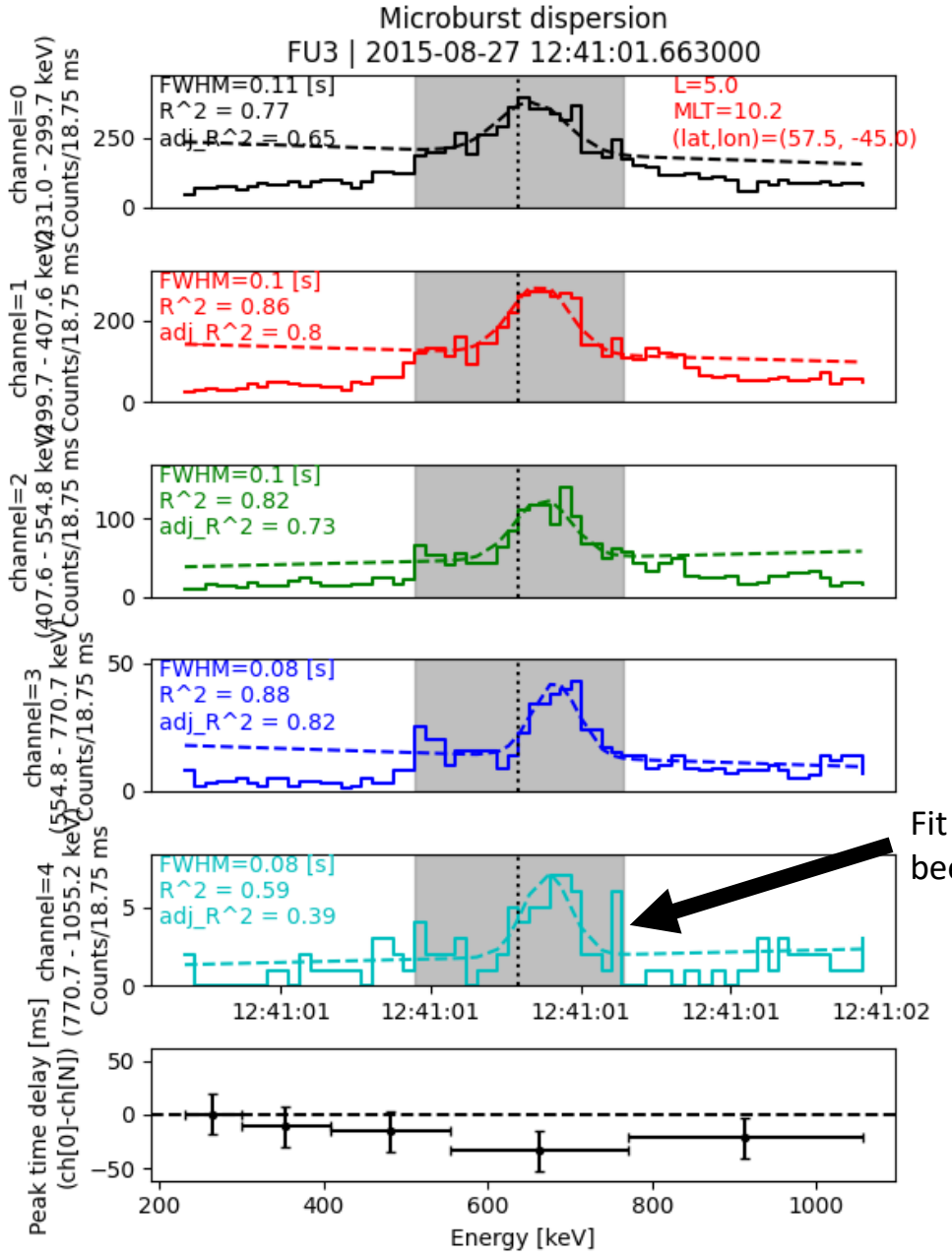
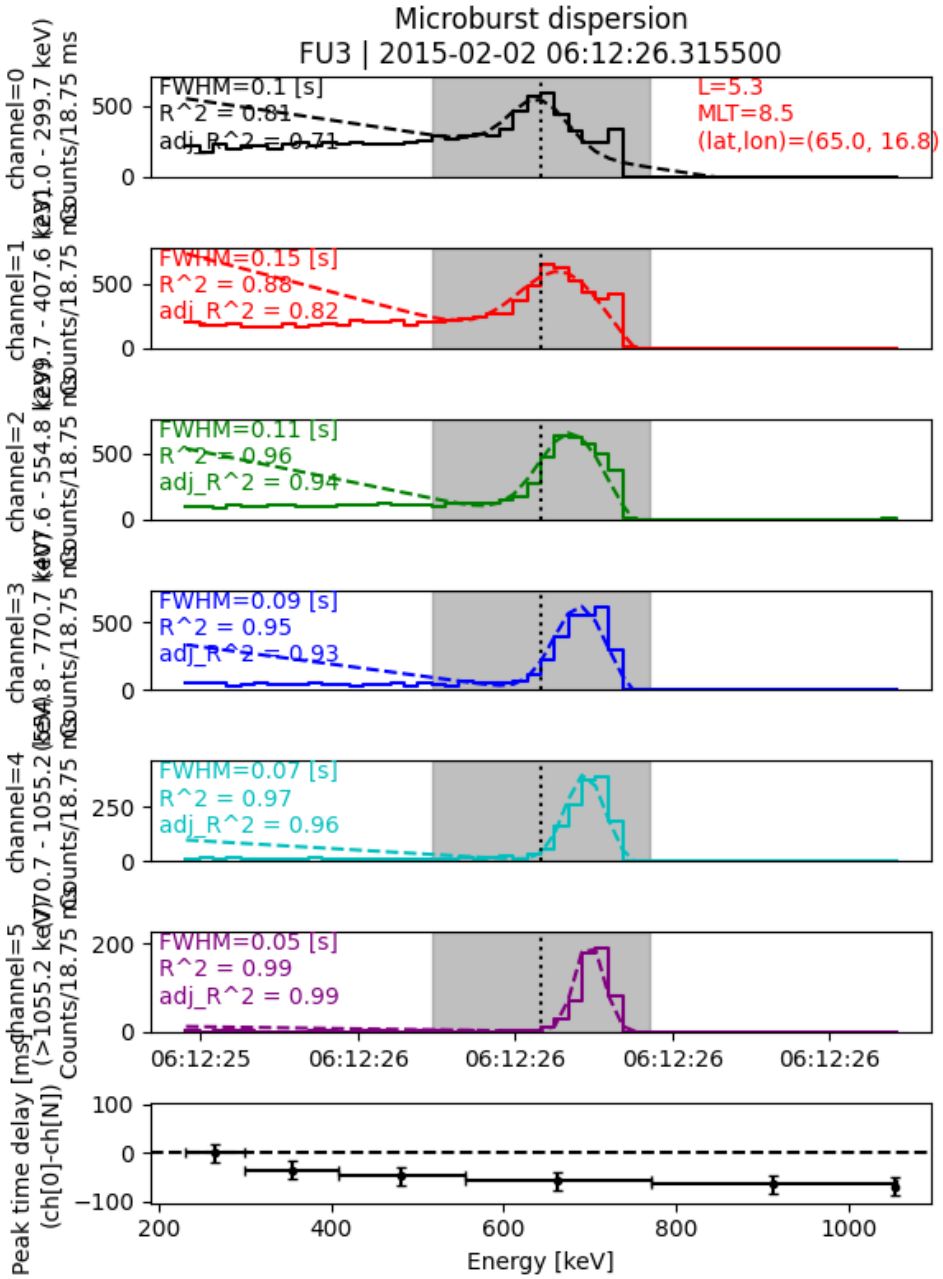
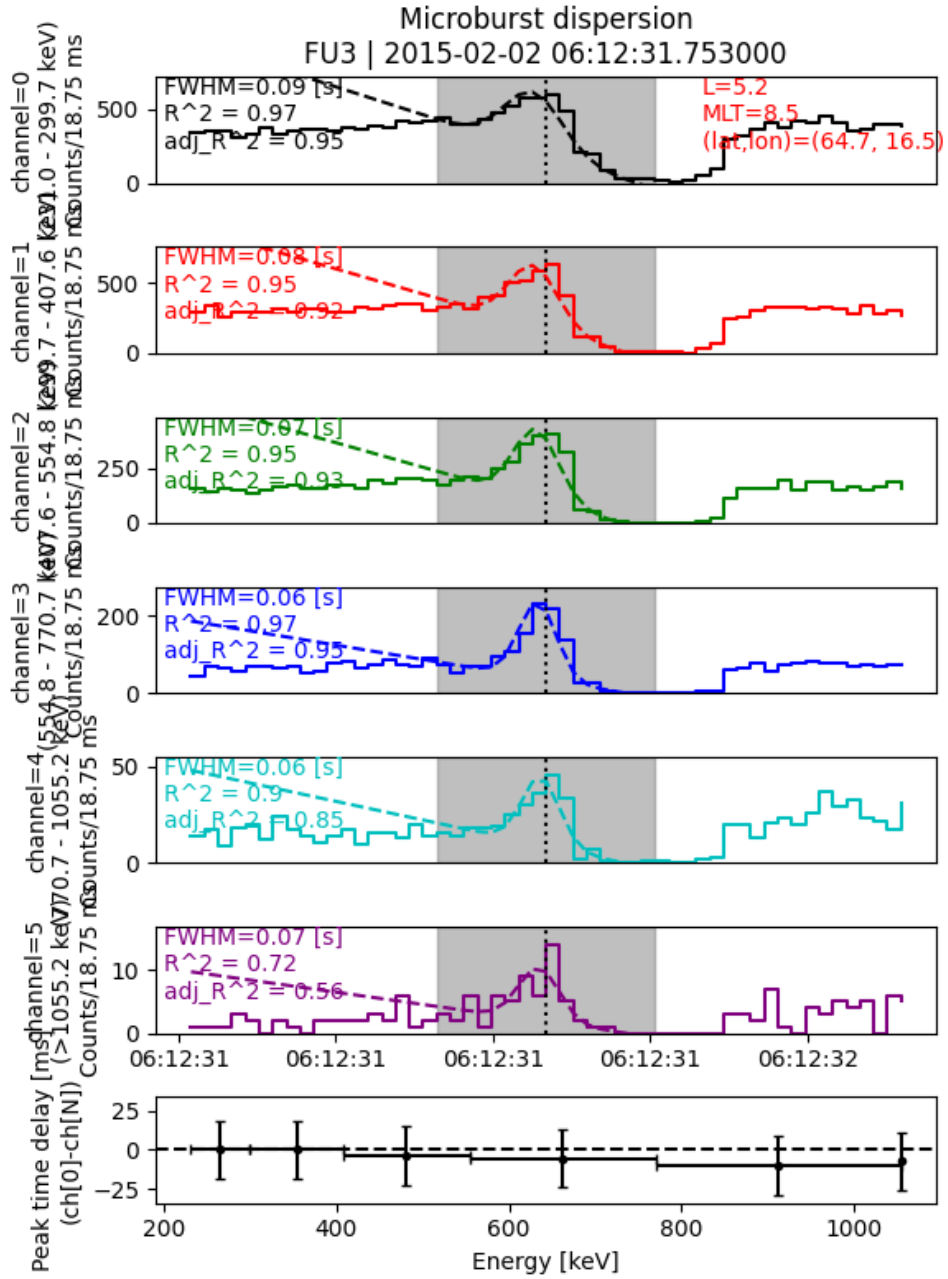


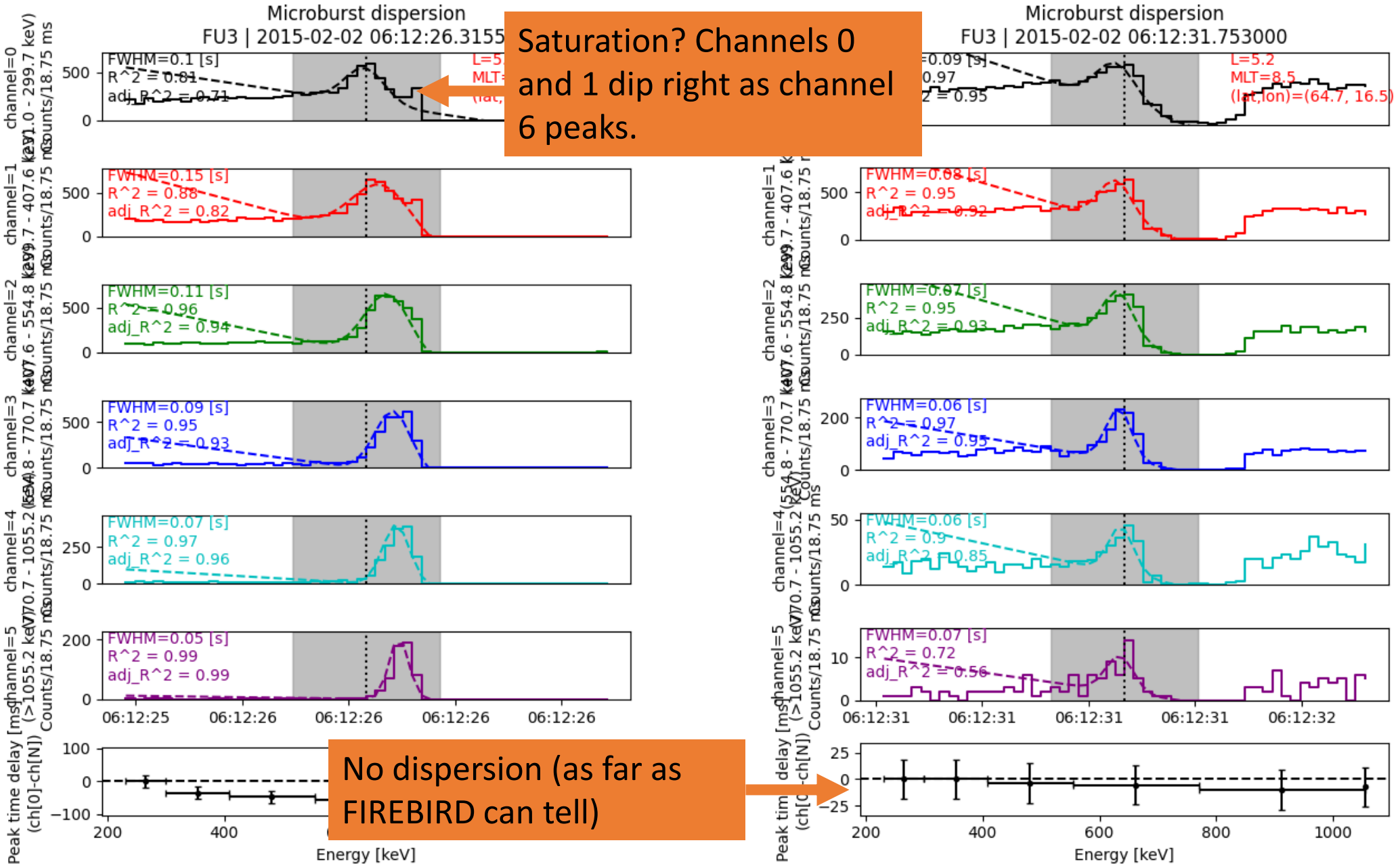




Fit could have been better


Microburst dispersion
FU3 | 2015-02-02 06:12:26.315500
FWHM=0.1 [s]
R^2 = 0.81
adj_R^2 = 0.71
L=5.3
MLT=8.5
(lat,lon)=(65.0, 16.8)
FWHM=0.15 [s]
R^2 = 0.88
adj_R^2 = 0.82
FWHM=0.11 [s]
R^2 = 0.96
adj_R^2 = 0.94
FWHM=0.09 [s]
R^2 = 0.95
adj_R^2 = 0.93
FWHM=0.07 [s]
R^2 = 0.97
adj_R^2 = 0.96
FWHM=0.05 [s]
R^2 = 0.99
adj_R^2 = 0.99
channel=0 (299.7 - 1055.2 keV) Counts/18.75 ms
channel=1 (299.7 - 407.6 keV) Counts/18.75 ms
channel=2 (407.6 - 554.8 keV) Counts/18.75 ms
channel=3 (554.8 - 770.7 keV) Counts/18.75 ms
channel=4 (770.7 - 1055.2 keV) Counts/18.75 ms
channel=5 (>1055.2 keV) Counts/18.75 ms
06:12:25
06:12:26
Peak time delay [ms] (ch[0]-ch[N])
Energy [keV]


Microburst dispersion
FU3 | 2015-02-02 06:12:31.753000
FWHM=0.09 [s]
R^2 = 0.97
adj_R^2 = 0.95
L=5.2
MLT=8.5
(lat,lon)=(64.7, 16.5)
FWHM=0.08 [s]
R^2 = 0.95
adj_R^2 = 0.92
FWHM=0.07 [s]
R^2 = 0.95
adj_R^2 = 0.93
FWHM=0.06 [s]
R^2 = 0.97
adj_R^2 = 0.95
FWHM=0.06 [s]
R^2 = 0.9
adj_R^2 = 0.85
FWHM=0.07 [s]
R^2 = 0.72
adj_R^2 = 0.56
channel=0 (299.7 - 1055.2 keV) Counts/18.75 ms
channel=1 (299.7 - 407.6 keV) Counts/18.75 ms
channel=2 (407.6 - 554.8 keV) Counts/18.75 ms
channel=3 (554.8 - 770.7 keV) Counts/18.75 ms
channel=4 (770.7 - 1055.2 keV) Counts/18.75 ms
channel=5 (>1055.2 keV) Counts/18.75 ms
06:12:31
06:12:32
Peak time delay [ms] (ch[0]-ch[N])
Energy [keV]


Microburst dispersion
FU3 | 2015-02-02 06:12:26.3155
Microburst dispersion
FU3 | 2015-02-02 06:12:31.753000
Saturation? Channels 0 and 1 dip right as channel 6 peaks.
No dispersion (as far as FIREBIRD can tell)
Energy [keV]
Energy [keV]