Veto streams studies with pyCBC (and MBTA) offline O3 results

Viola Sordini, Patrice Verdier

March 12th 2021

Inputs

- Veto streams by Florent (April 1st – May 11th 2019)

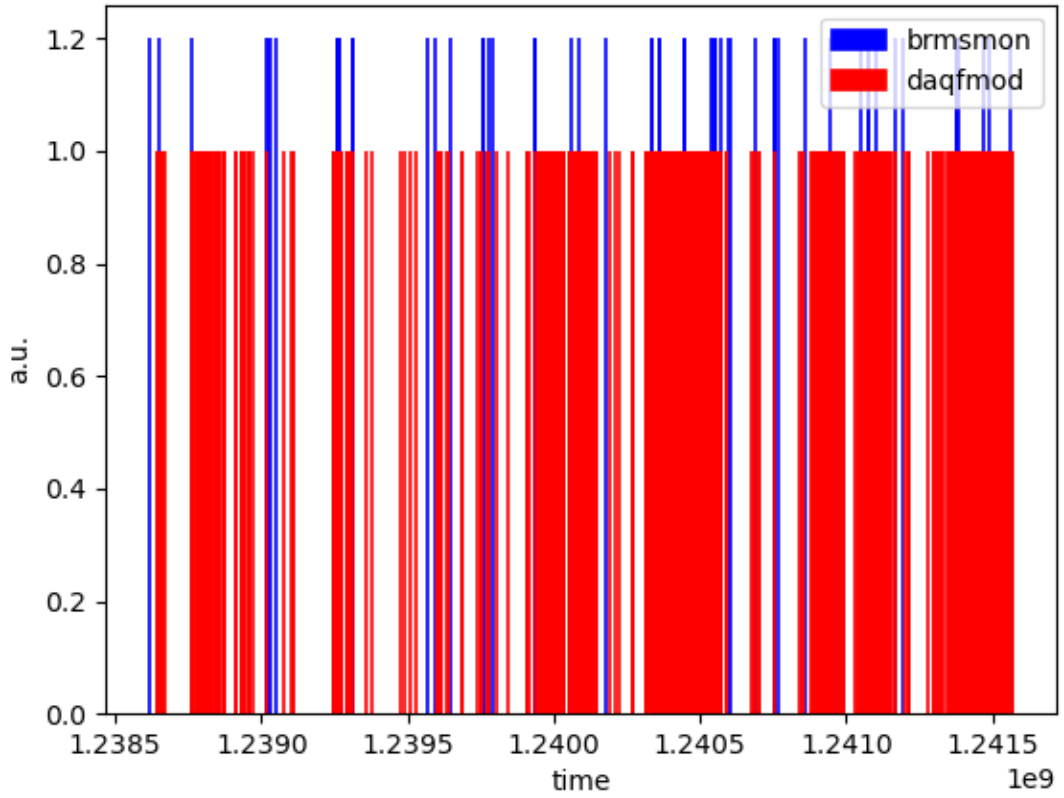
- pyCBC : V single triggers (SNR > 6), clustered by raw/rwSNR.
  Info: ['approximant', 'bank_chisq', 'bank_chisq_dof', 'chisq', 'chisq_dof', 'cluster_window', 'coa_phase', 'cont_chisq', 'cont_chisq_dof', 'end_time', 'f_lower', 'mass1', 'mass2', 'psd_var_val', 'search', 'sg_chisq', 'sigmasq', 'snr', 'spin1z', 'spin2z', 'stat', 'template_duration', 'template_id']

- MBTA :
  - cumulative number of events (32 Hz sampled) with SNR>4.8(4.5) for BBH and NSBH(BNS) search
  - info about gating and ExcessRate.

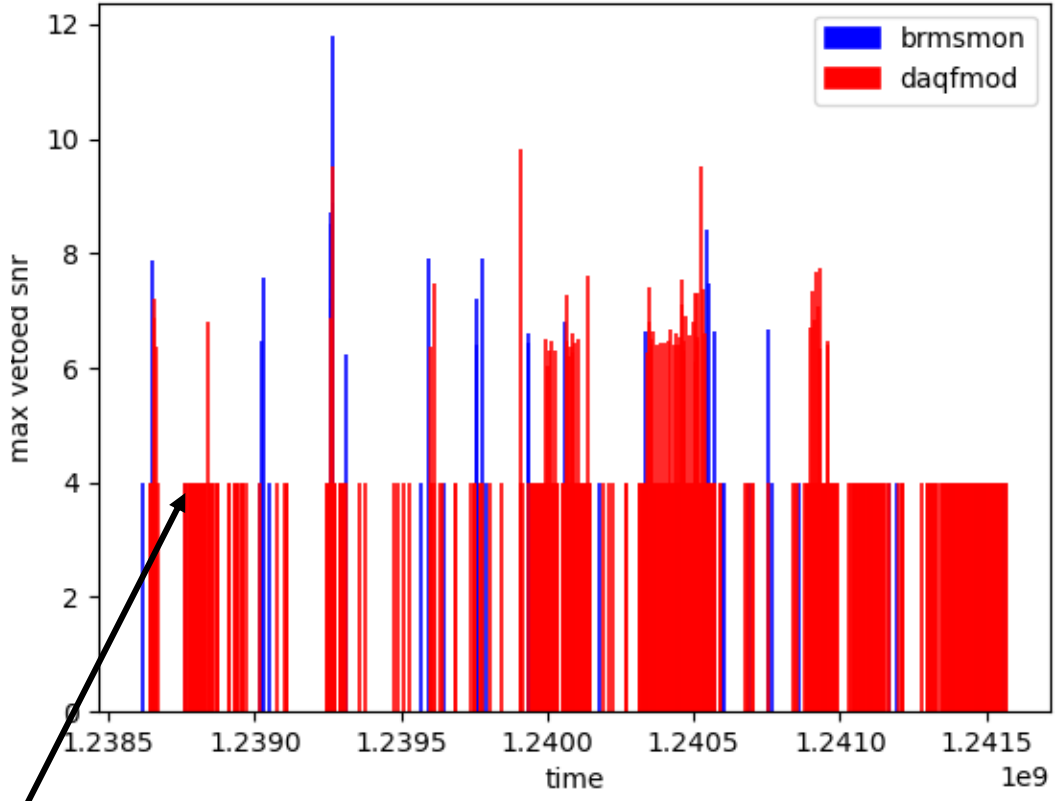
Only showing pyCBC results in this presentation

The veto streams

Distribution vs time

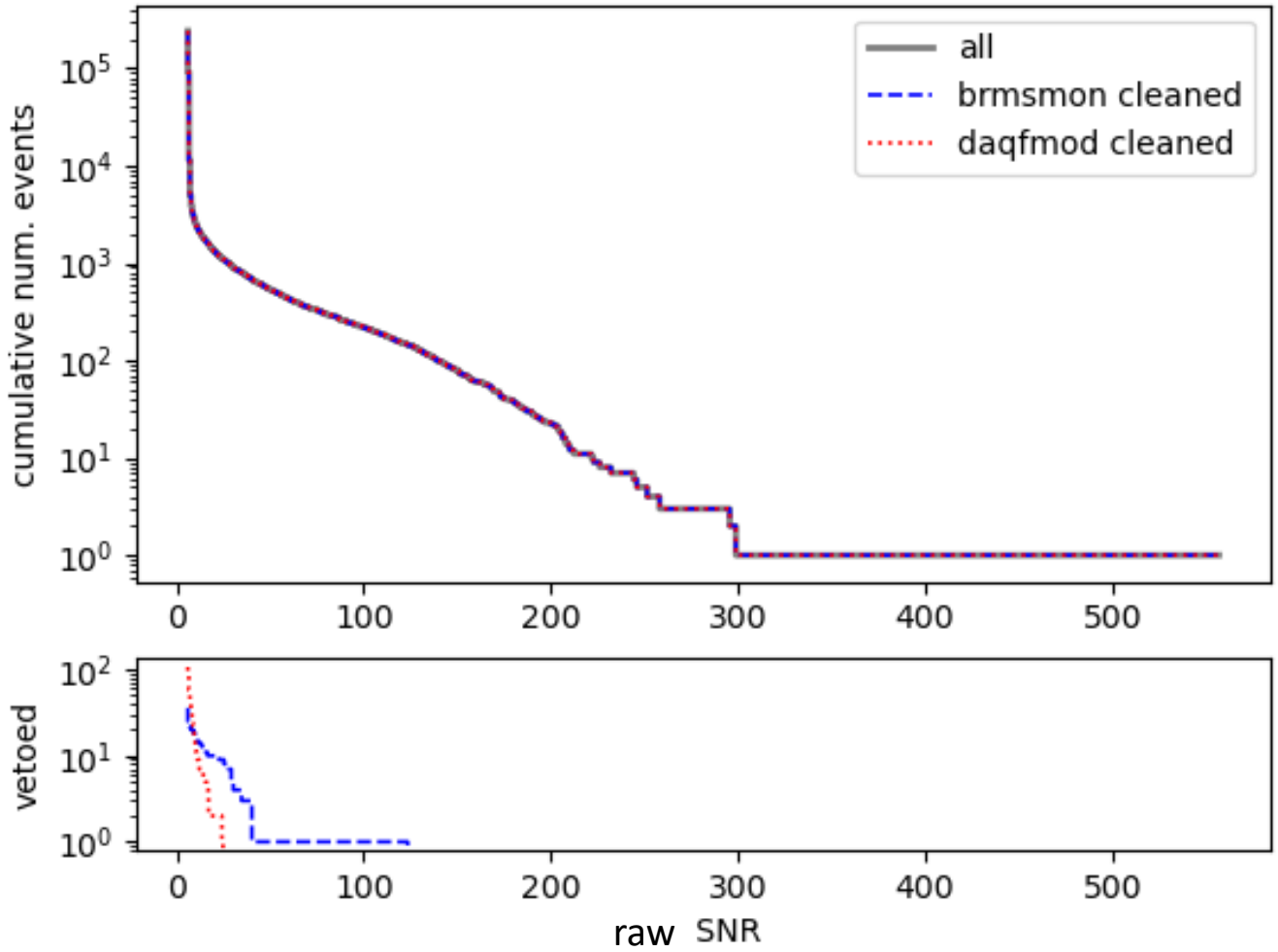


Maximum vetoed (rw)SNR



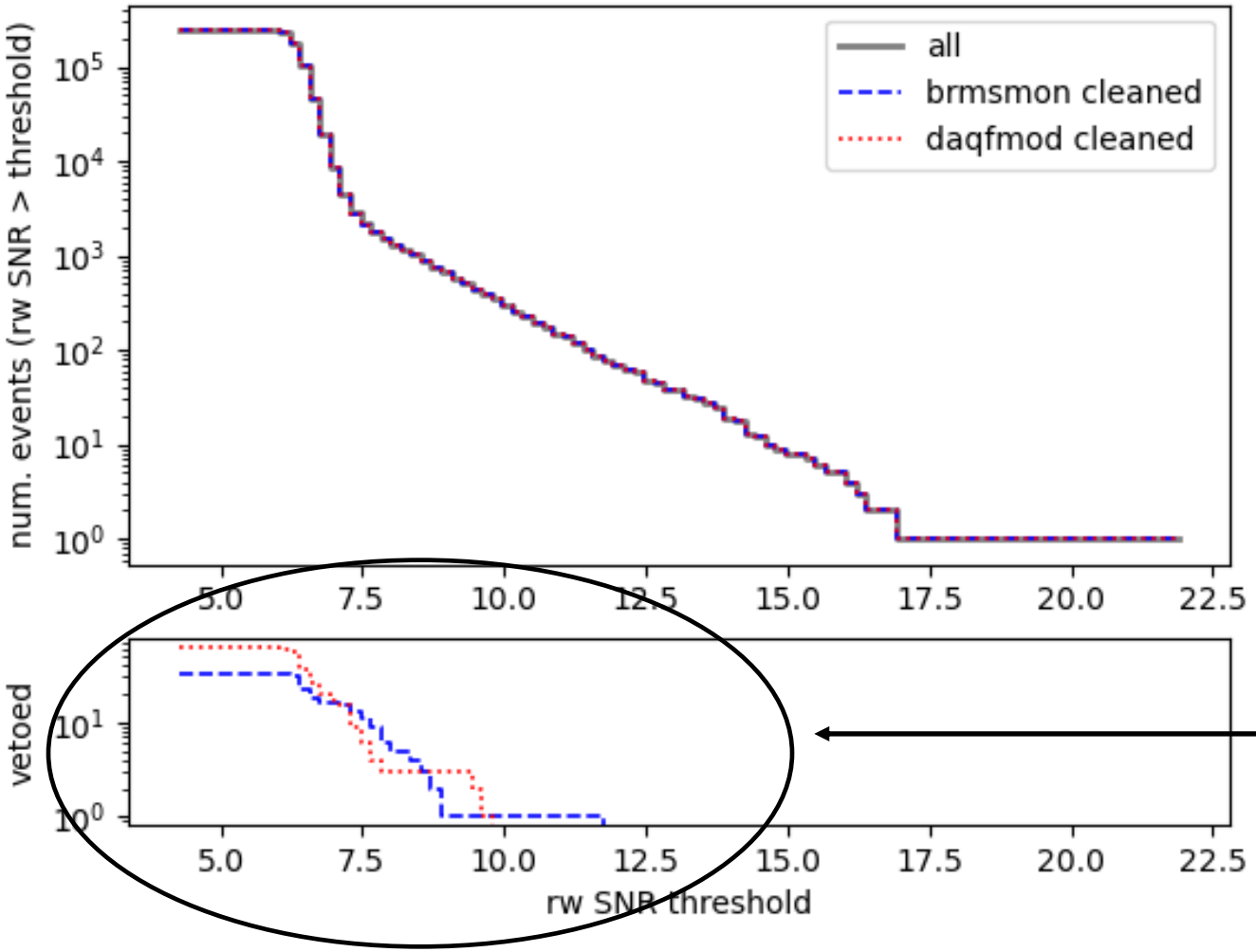
Vetoed SNR = 4 means no vetoed event

pyCBC – raw SNR



Cumulative number of vetoed events with raw SNR higher than the value on the x axis.

pyCBC – rw SNR



Cumulative number of vetoed events with raw SNR higher than the value on the x axis.

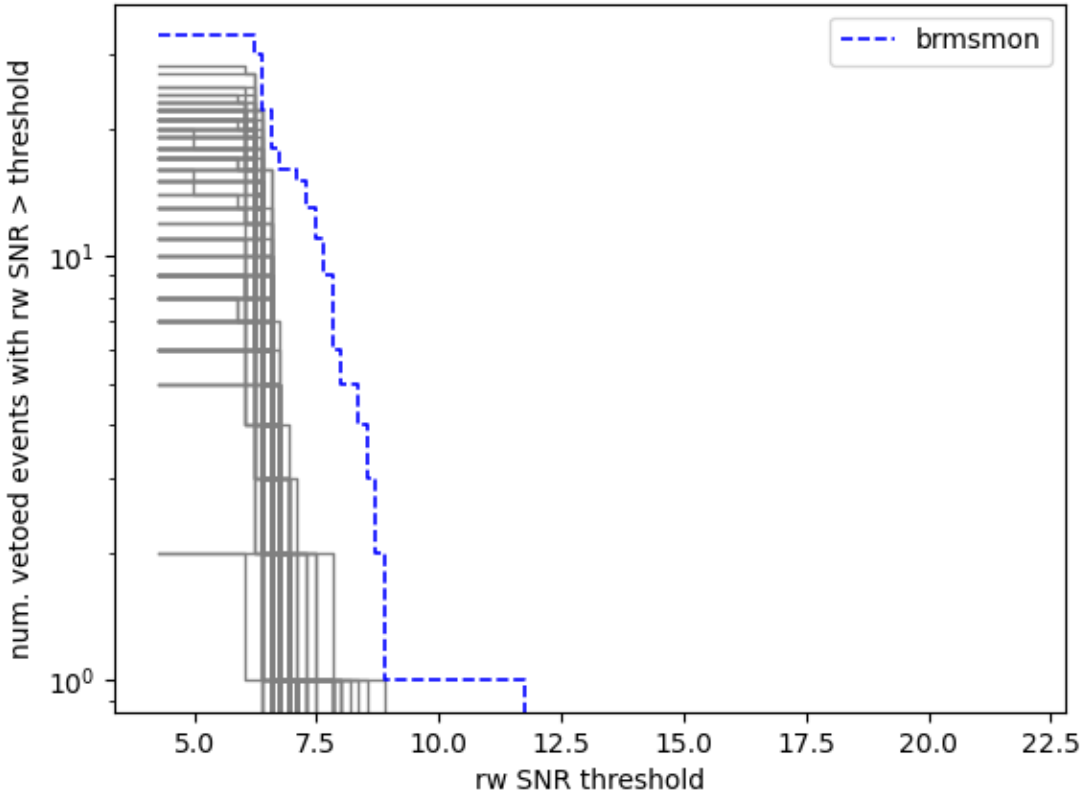
Overall, out of 244696 events

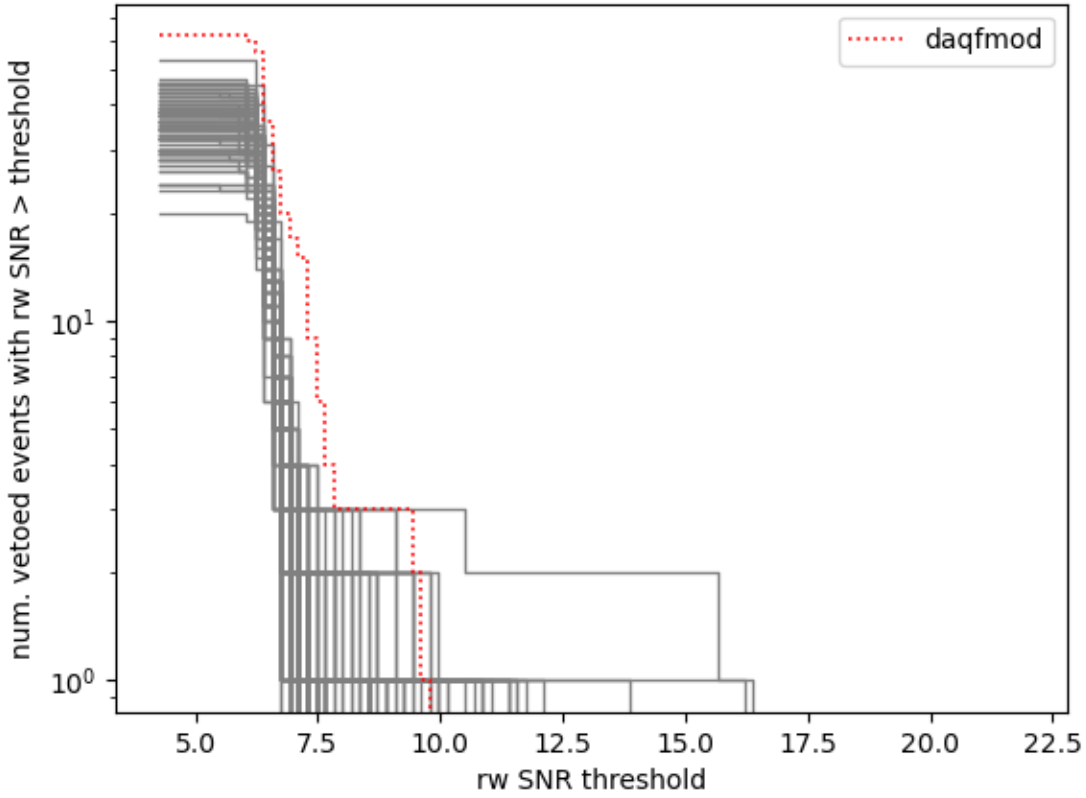
- 33 are vetoed by brmsmon (fraction 0.00013 +/- 0.000023)
- 62 are vetoed by daq_fmod (fraction 0.00025 +/- 0.00003)

In the next slides, these distributions when the vetoed segmentes are sihfted in time

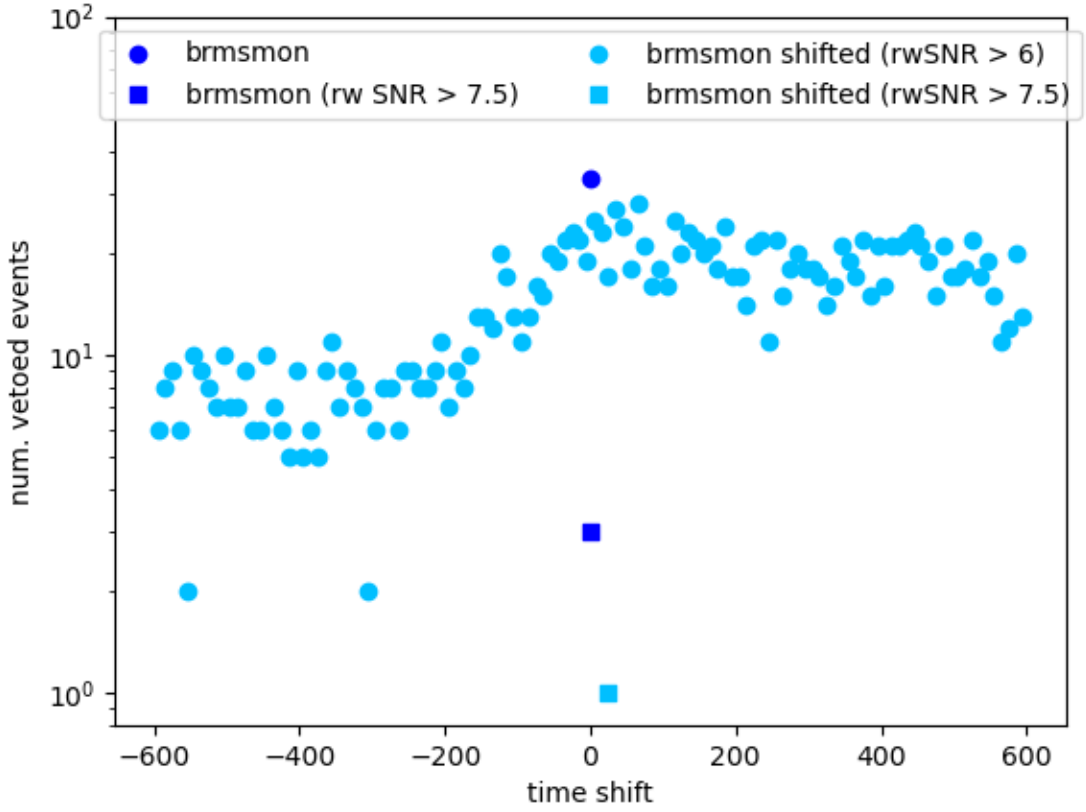
pyCBC – rw SNR – time shifts

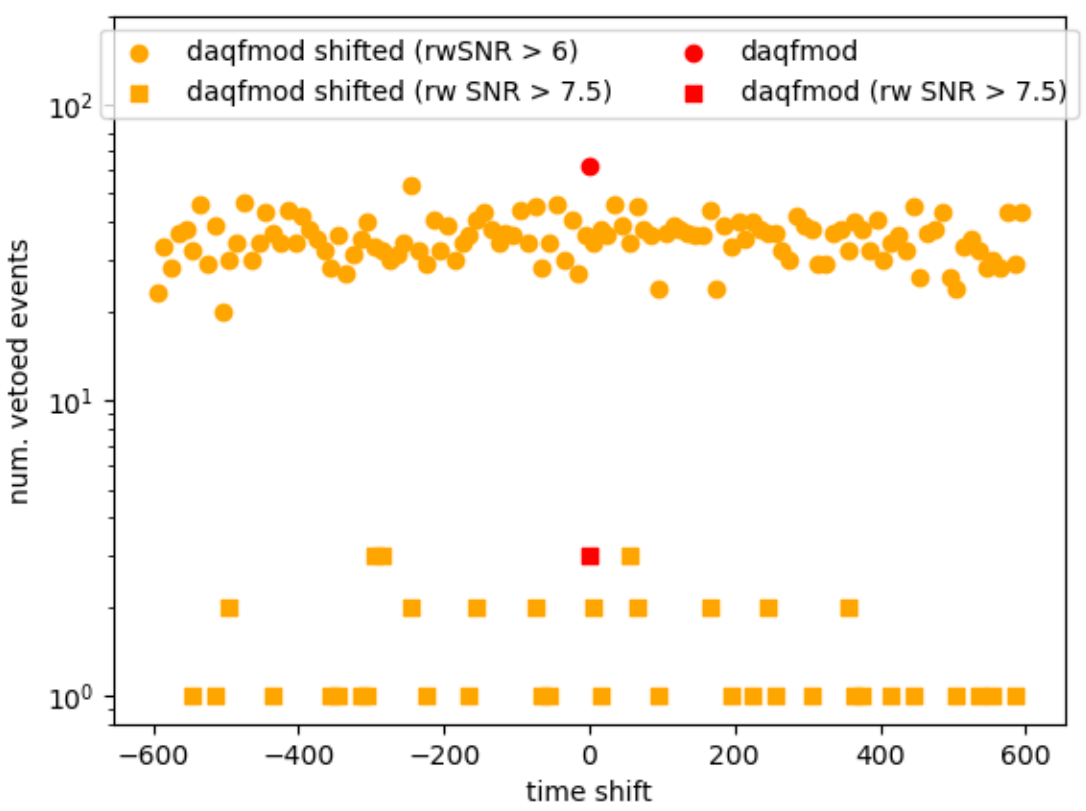
120 time shifts, from -600 to +600 seconds, in steps of 10 seconds





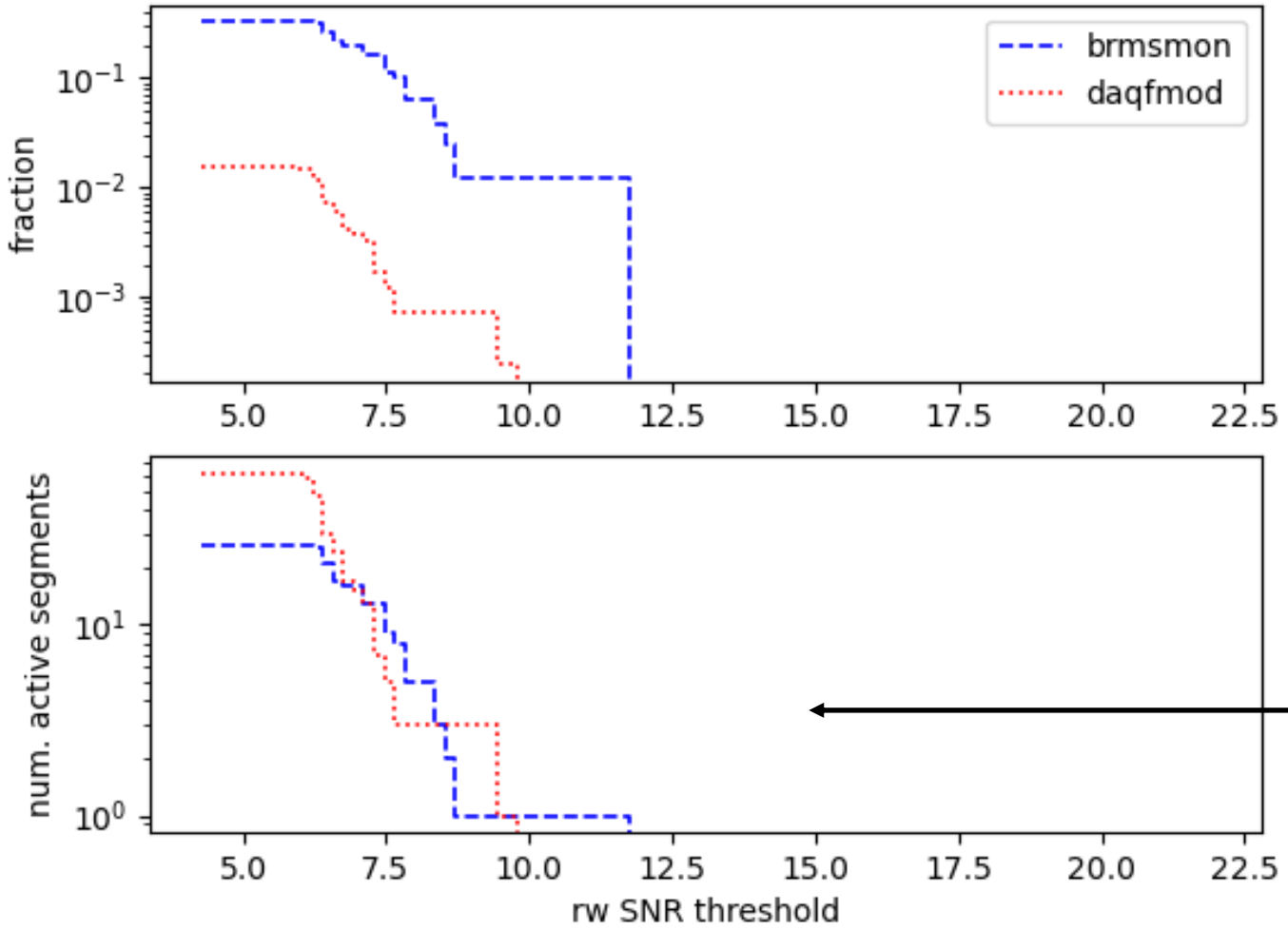
pyCBC – rw SNR – time shifts





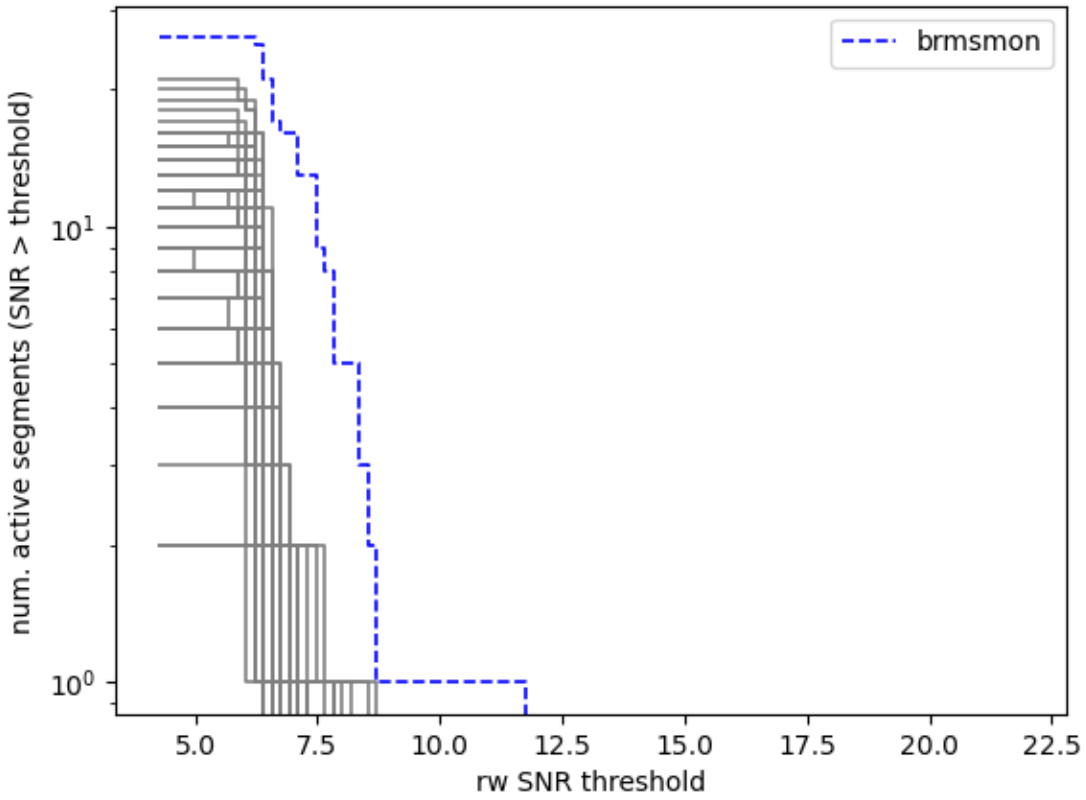
pyCBC – rw SNR – active segments

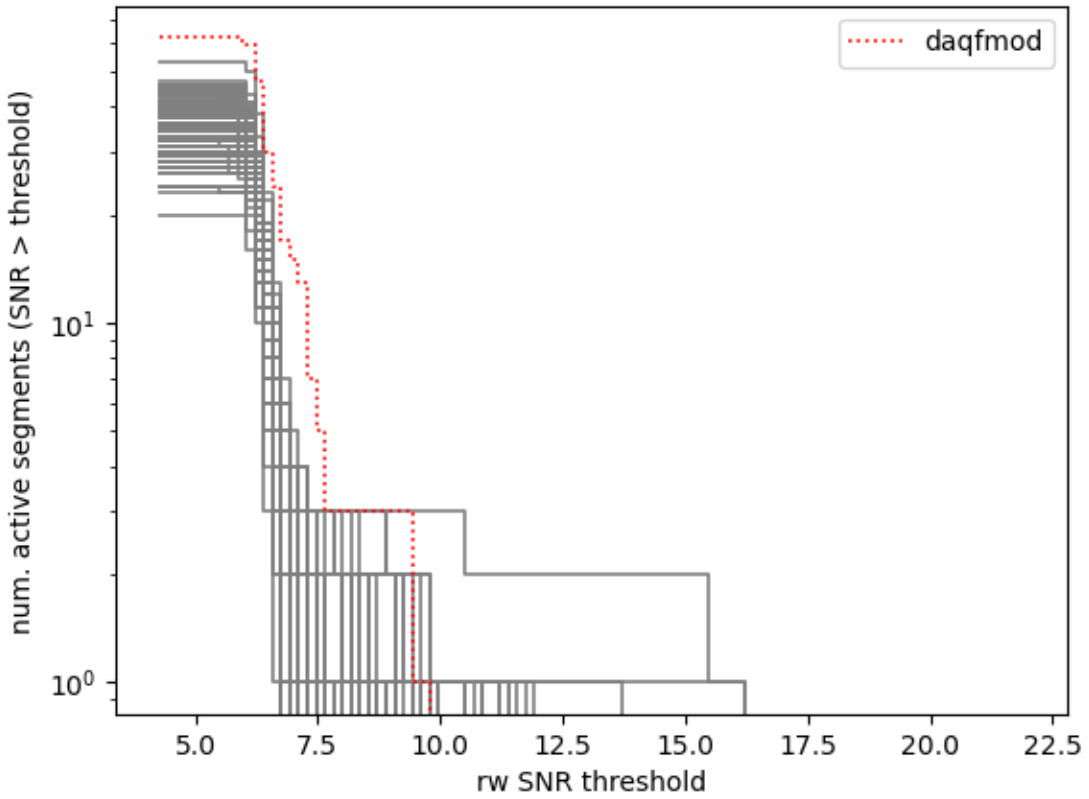
Looking at number (and fraction) of veto segments that actually did veto at least one trigger



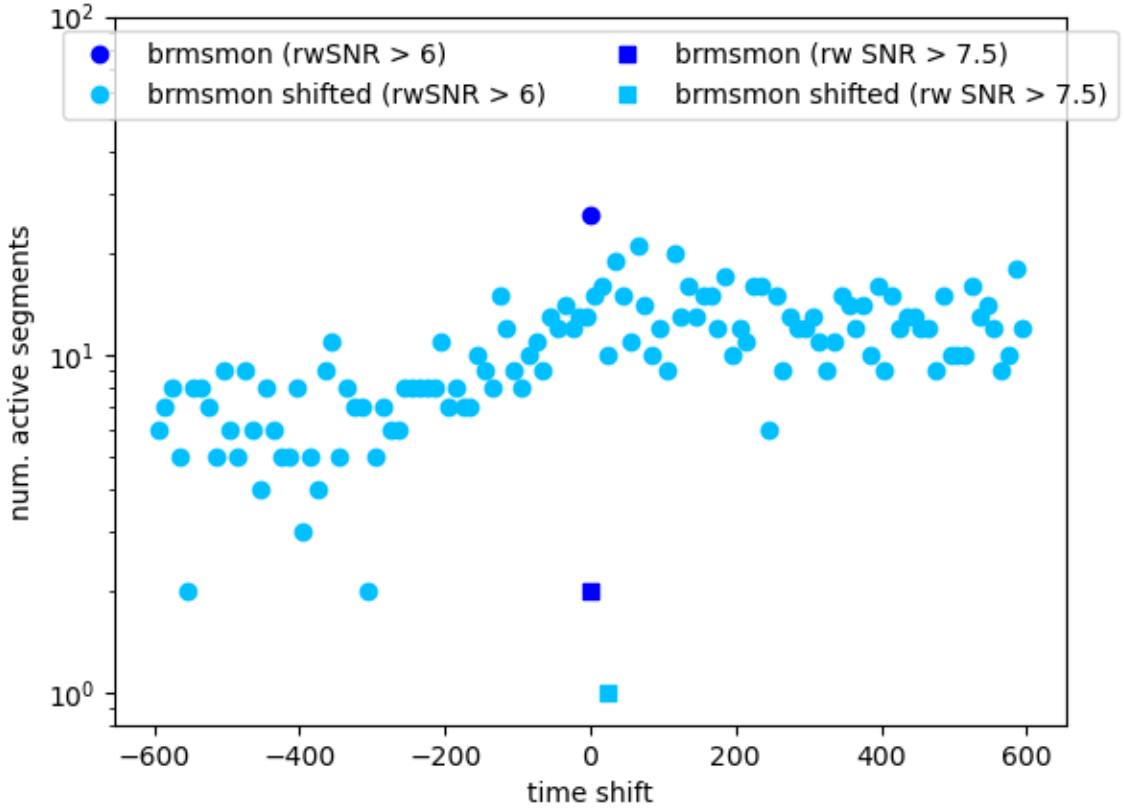
In the next slides, these distributions when the vetoed segmentes are sihfted in time

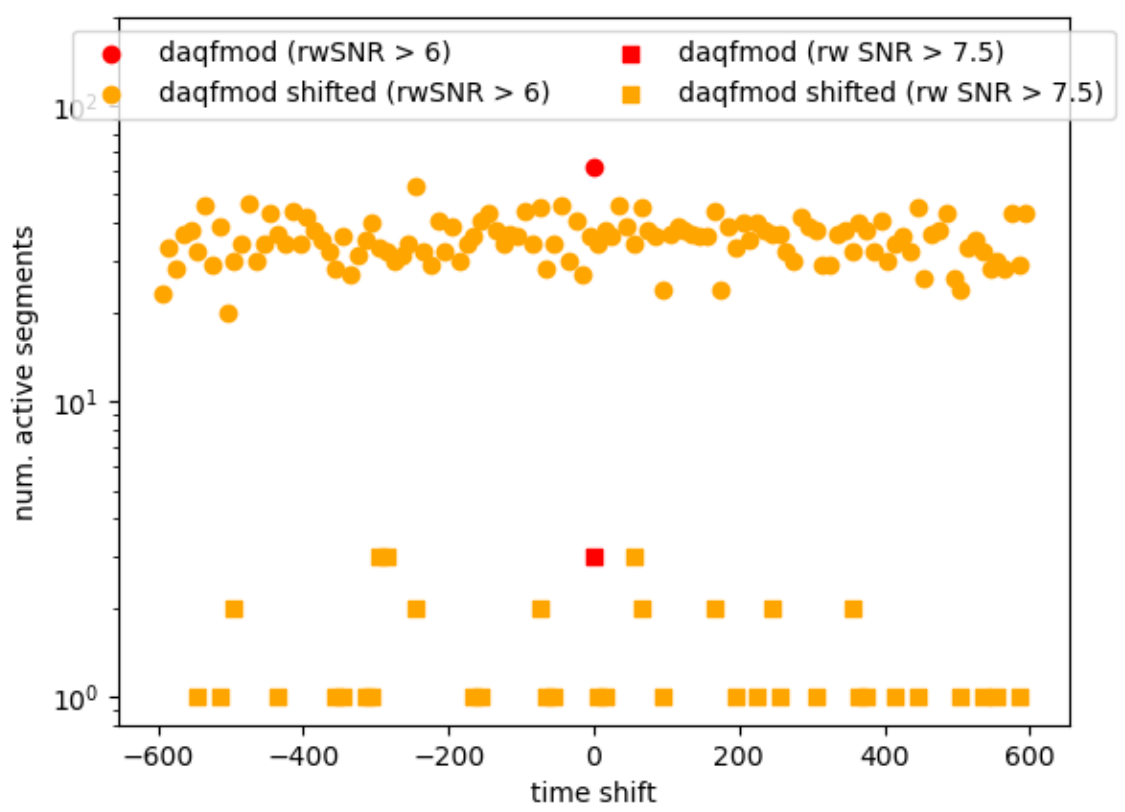
pyCBC – rw SNR – active segments with time shift



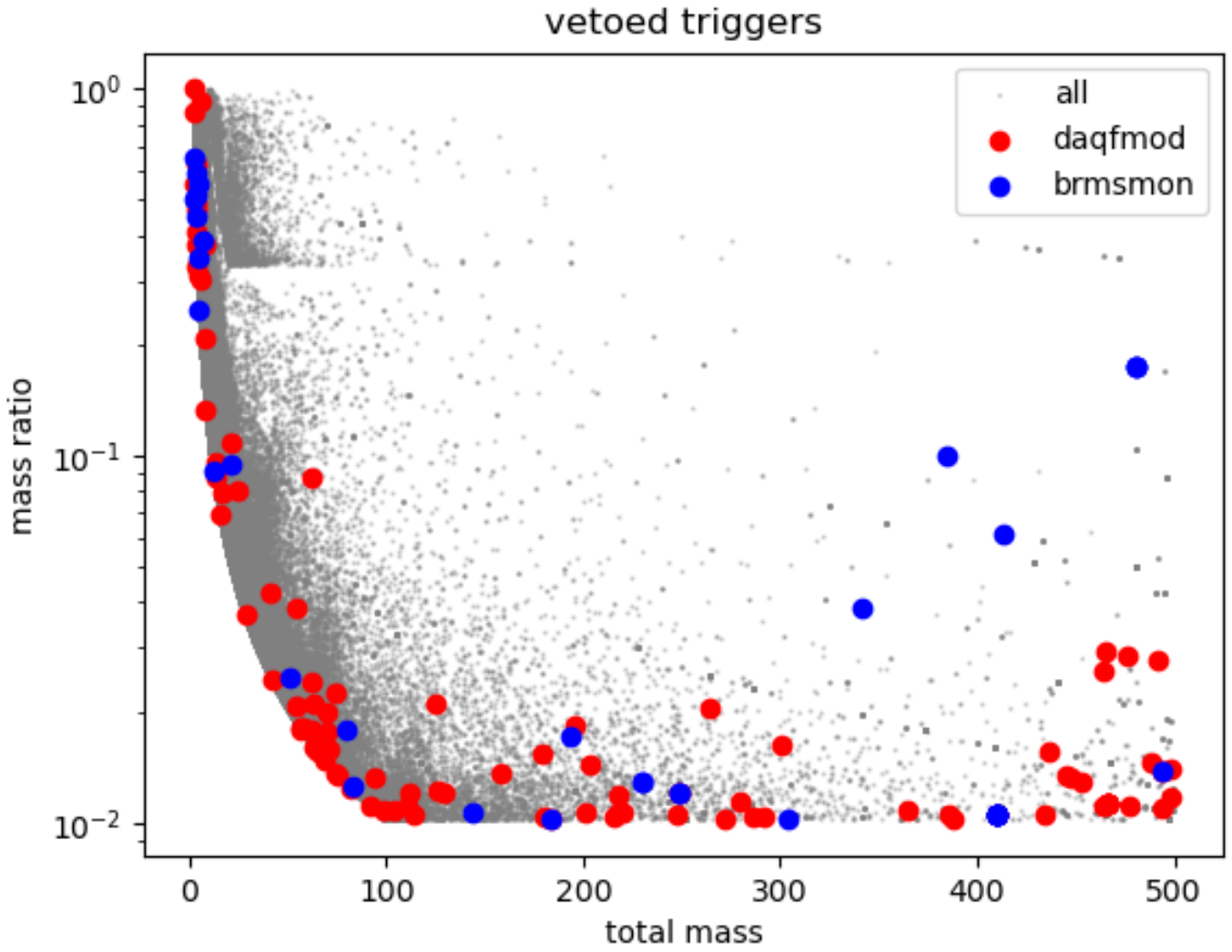


pyCBC – rw SNR – active segments with time shift





pyCBC – follow-up from last week discussion



Follow-up on total mass vs mass ratio of vetoed triggers