



MAX-PLANCK-GESELLSCHAFT



Max-Planck-Institut
für Gravitationsphysik
(Albert-Einstein-Institut)

Status of the High-Frequency gw burst search on S5Y2/VSR1 data set

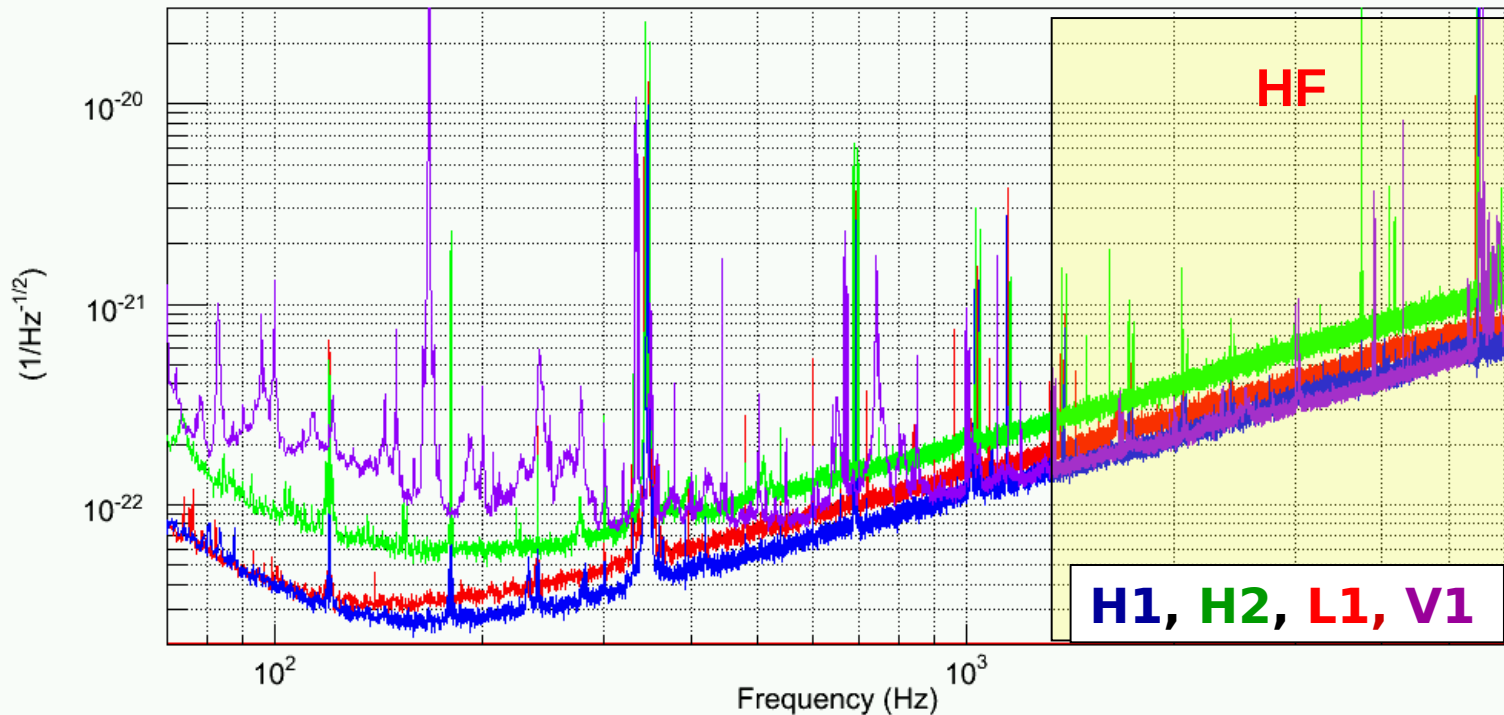
http://www.virgo.inl.infn.it/Wiki/index.php/VSR1/S5_2nd_year_6k

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High Frequencies Burst Search on S5Y2/VSR1

- Target : high frequency transients of GWs (1.28-6.0 kHz)
 - NS-NS merger and post-merger phases, NS instabilities, F-modes ...
 - BH-BH mergers with BH mass $< 8 M_{\text{sun}}$ and BH ring-down
 - SuperNovae and core collapses emitting at high frequency
- Bandwidth agreed within the LSC-Virgo Burst Group
 - Lower bound at 1.28 kHz to overlap with standard LSC searches ($< 2\text{kHz}$)
 - Upper bound at 6 kHz set by LIGO calibration



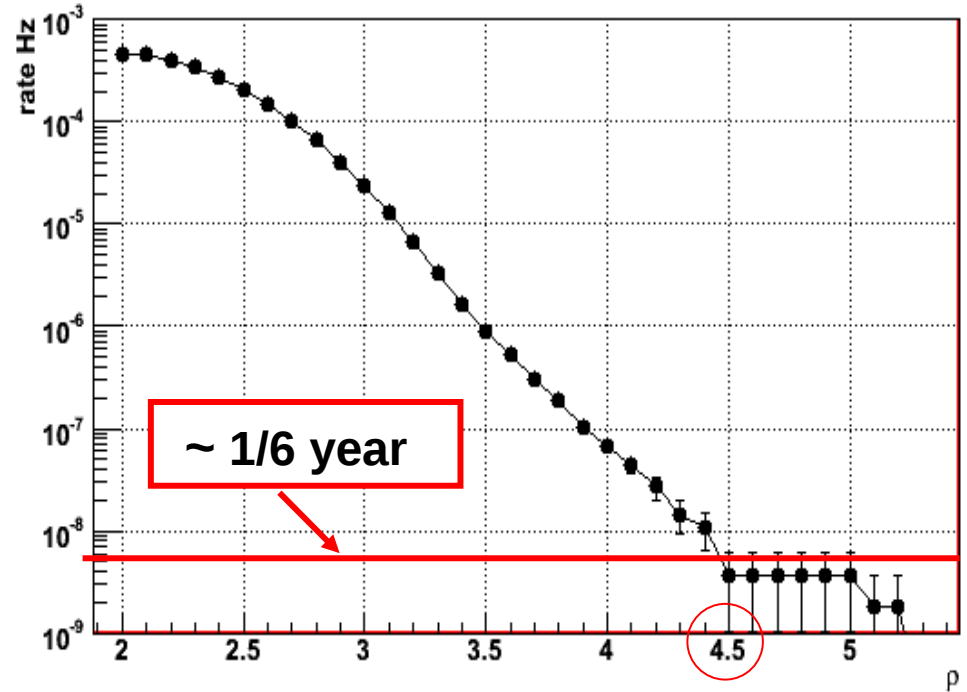
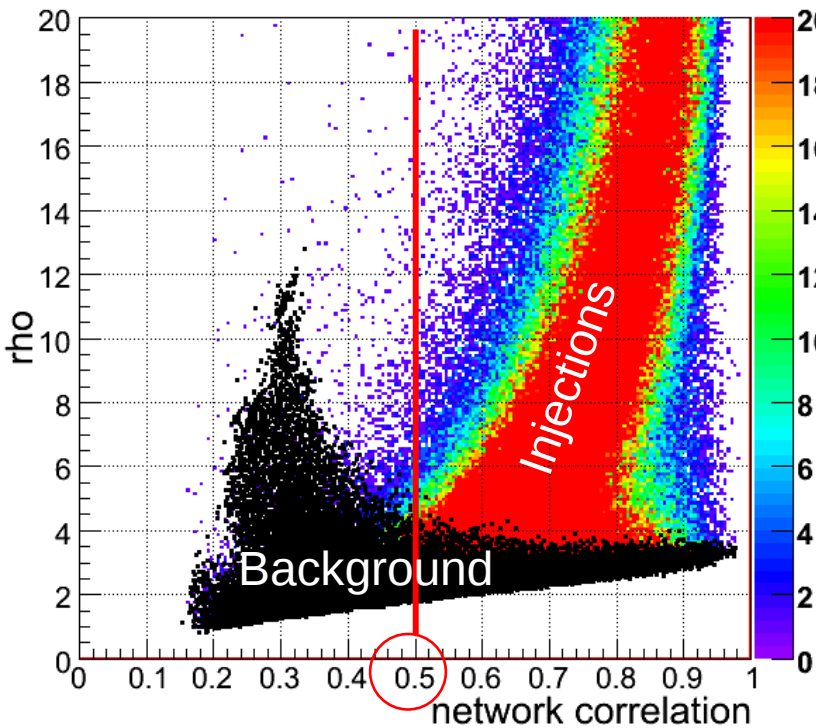
Status (Nov '08)

- **Background estimation:** ✓
 - 192 lag shifts, shift time: 1.56 s, 96 lags used for tuning.
- **Simulations**
 - **HF MDC set #1 (Sine-Gaussians Q9):** ✓
 - 13 central frequencies, 18 amplitude factors.
 - **HF MDC set #2 (Mixed, still to be discussed):** X
 - 6 SGQ3, 6 SGQ100, 5 White Noise Burts, 3+3 Damped-Sinusoids, 2 SuperNovae waveforms

Network Configuration	Live Time after CAT2 [days]	Mature for review
V1H1H2L1	68.9	✓
L1H1H2	123.7	✓
V1H1H2	15.6	✓
H1H2	35.5	X
L1H1	6.9	X
L1V1	6.1	X

HF cWB search: sample results for V1H1H2L1

Q9



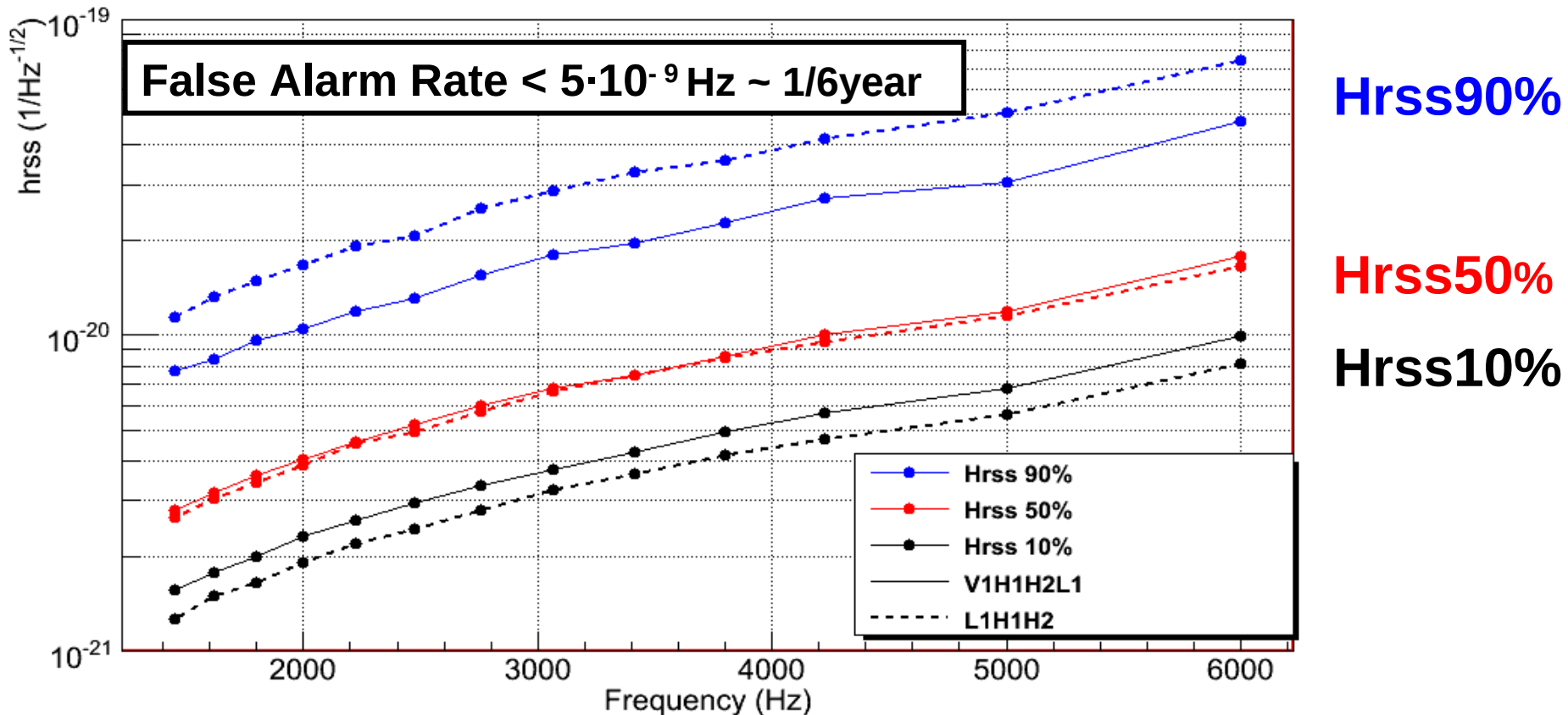
tuning according to burst group prescriptions:

- preliminary false alarm threshold around 1/ few years

Null result:
upper limit

Positive result: measure confidence of selected events with more time lags, ranking events according to their ρ (SNR). Only events with false rate $< 1/10$ year will be scrutinized as possible gw candidates.

Detection Efficiency for SGQ9: comparison



- detection efficiencies scale as expected following the S_{hh}
- JW1 is representative of the detection efficiency of the whole VSR1
- the 4-fold network gains at 90% (better sky coverage)

Next steps...

- **LSC calibration issues at HF: work on-going**
 - use the V4 model to assess the systematic errors in the V3
 - still 2 weeks to have feed-back from the Calibration group
- **Sanity checks: on-going**
 - live times, DQ lists, cross-checks with low freq. Results, etc.
- **Internal review of the analysis: not started yet**
 - more checks asked by reviewers?
 - final tuning of the analysis thresholds: plan ready for approval
 - ask to open the box: Dic. LSC/Virgo Meeting?
- **Astrophysical interpretation of the results**
 - finalize&produce the HF MDC set #2 (mixed waveforms)
 - contribute to the development of other HF MDC sets (elliptically polarized damped sinusoids, numerical waveforms)
 - process the new MDC sets