



Update on the LIGO-TAMA S2/DT8 Joint Data Analysis

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For the LIGO-TAMA Joint Working Group

Joint Working Group

- Small group charged with carrying out a joint analysis of the LIGO S2 – TAMA DT8 data.
- LIGO members: Brady, Cadonati, Di Credico, Finn, Katsavounidis, Lazzarini, Ray Majumder, Marka, Saulson, Summerscales, Sutton, Sylvestre, Whitcomb.

Goals

- MOU: “To work toward practical and optimized methods for doing coincidences between the TAMA and LIGO detectors...”
- Publish results!

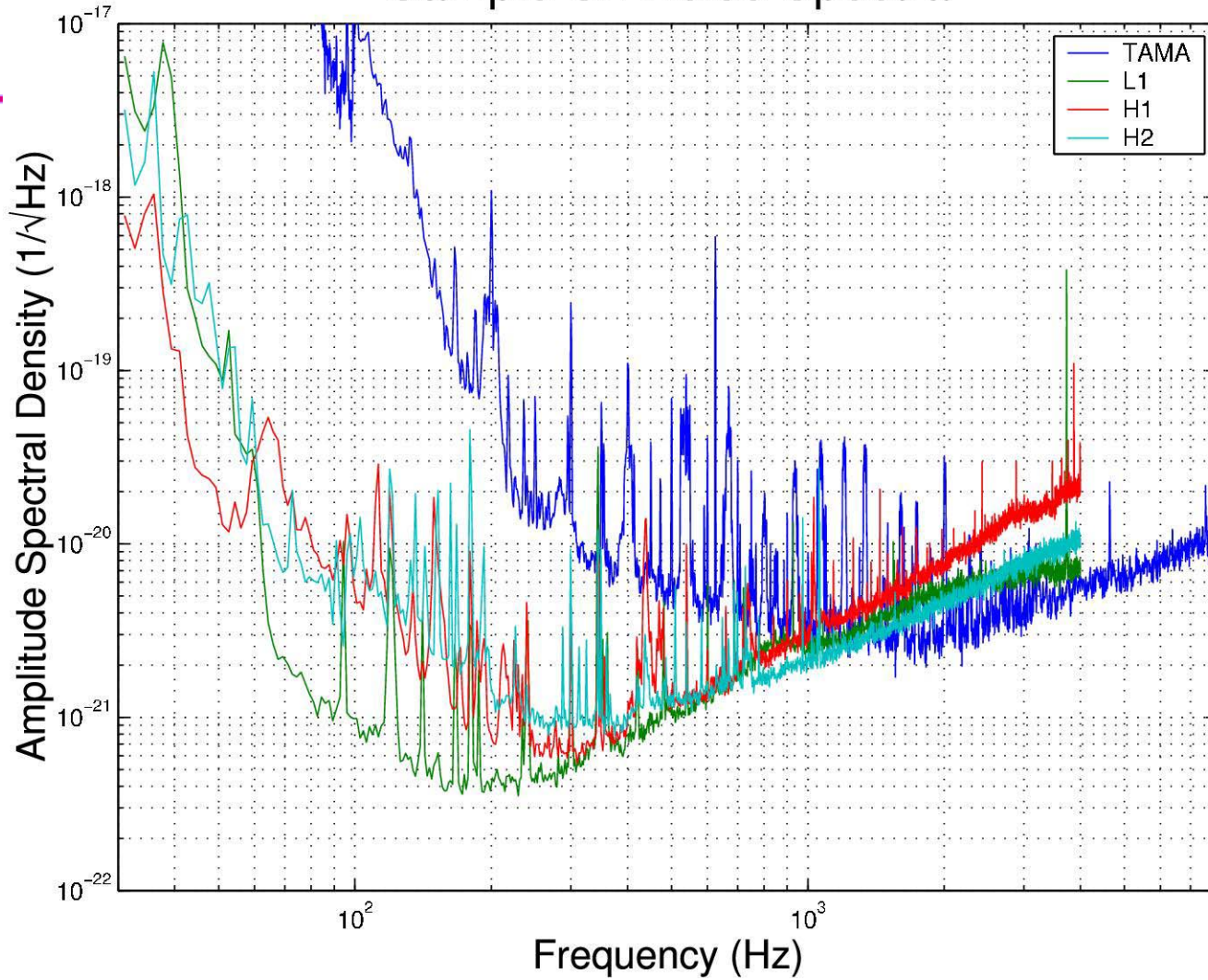
- S1-style bursts analysis
 - » single-IFO event generation
 - » 4 x coincidence
 - » coherence test

- GRB search
 - » study GRB030329
 - » LIGO external trig pipeline
 - » Marka + 1 TAMA person

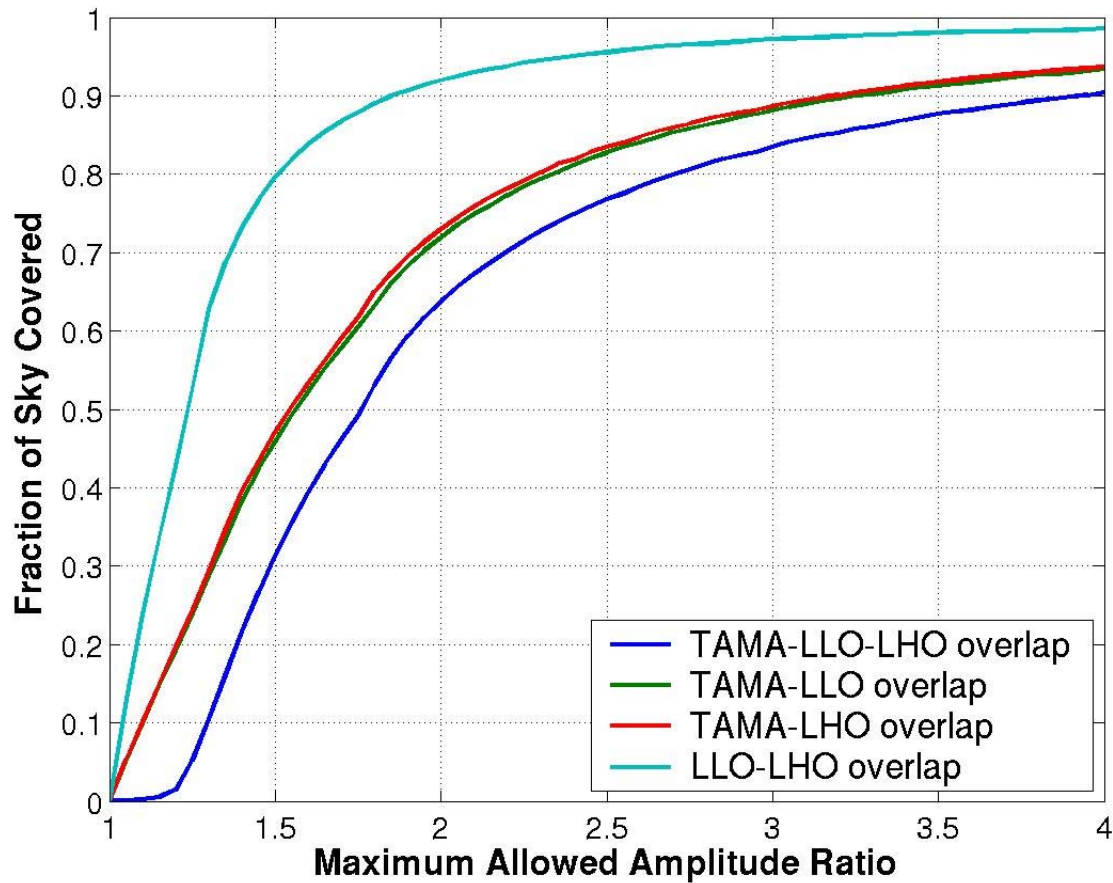
Untriggered Analysis: Plans

- Event Generation on single-IFO basis.
 - » Tune for fixed false rate in each IFO.
 - » Maximize efficiencies for Gaussians and sine-Gaussians.
 - » Measure efficiencies for Zwerger-Mueller/Dimmelmeier waveforms.
- Vetoes done on single-IFO basis.
 - » Use results of LIGO veto/glitch study.
- 4 x Coincidence & Coherence.
 - » temporal, others?
 - » r-statistic, test Sylvestre's coherent TFCLUSTERS technique.
- Upper limits.
 - » rate upper limit on detected events
 - » rate upper limit versus strain amplitude (G, SG – ZM/D?)

Sample S2 Noise Spectra



LIGO-TAMA Antenna Overlap



Differences from LIGO S2 Analysis

- Different sensitivity curves
 - » Focus on coincidence in 300Hz – 3000Hz range.
 - » Poor LIGO noise above 1kHz may be a problem.
- Different ETGs for different IFOs
 - » LIGO: Excess Power, TFCLUSTERS, BlockNormal
 - » TAMA: Excess Power
 - » Coincidence nontrivial; rely on coherent tests.
- Strongly non-aligned detectors
 - » Must study effects on coherent tests.

Untriggered Analysis: Status

- Trigger Generation (on playground)
 - » Power: First H1, L1 triggers now available; efficiencies ~Oct 15.
 - » TFCLUSTERS: H1, H2, L1 triggers and efficiencies ~Oct 15.
 - » BlockNormal: First H1, H2, L1 triggers ~Oct 17, fully tuned ~Oct 31.
- Vetoes
 - » Use LIGO vetoes based on performance in 500-3000Hz range, ~Oct 10.
- Coincidence & Coherent Tests
 - » ~2+ weeks for tuning once triggers and data exchanged (should begin in next week or so).
- Preliminary results:
 - » Probably after December GWDAAW meeting (likely next face-to-face meeting with TAMA).

GRB030329 Analysis: Status

- Can use existing externally triggered pipeline without modification.
- Marka travelling to Japan in early November to coordinate analysis with TAMA representative.
- Final results for November LSC meeting.