



Introduction to the Detector Characterization Sessions

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Introd. to Detect. Charact. Sessions - 2003.3.18

K. Riles - University of Michigan

Recent Progress

- **Tremendous progress in last year on all fronts:**
 - DMT infrastructure much enhanced
(thanks to John, Szabi, Daniel, Masahiro)
 - Many DMT monitors reaching maturity
(thanks to DaveC, Ed, Masahiro, Szabi, Sergey, Rauha, PatrickS, John)
 - New DMT monitors in the pipeline
(thanks to TimO, AdrianO, BrianS, Natalia)

Recent Progress

- **Tremendous progress in last year on all fronts: (cont.)**
 - Data run operations much improved, after E7 / S1 troubles:
 - Clearer (and more useful) scimon instructions
 - Figures of merit
 - More automation
 - More projectors (thanks, Fred & Mark!)
 - (thanks to many authors, testers, & scimons;
M1, M2, E9 runs well worth the effort!)
 - Particularly impressive improvements in procedures for
 - Calibrations (thanks to Gaby, Mike, Brian, Rana, PatrickS)
 - Signal Injections (thanks to PeterSh, Szabi, Isabel, Sukanta)

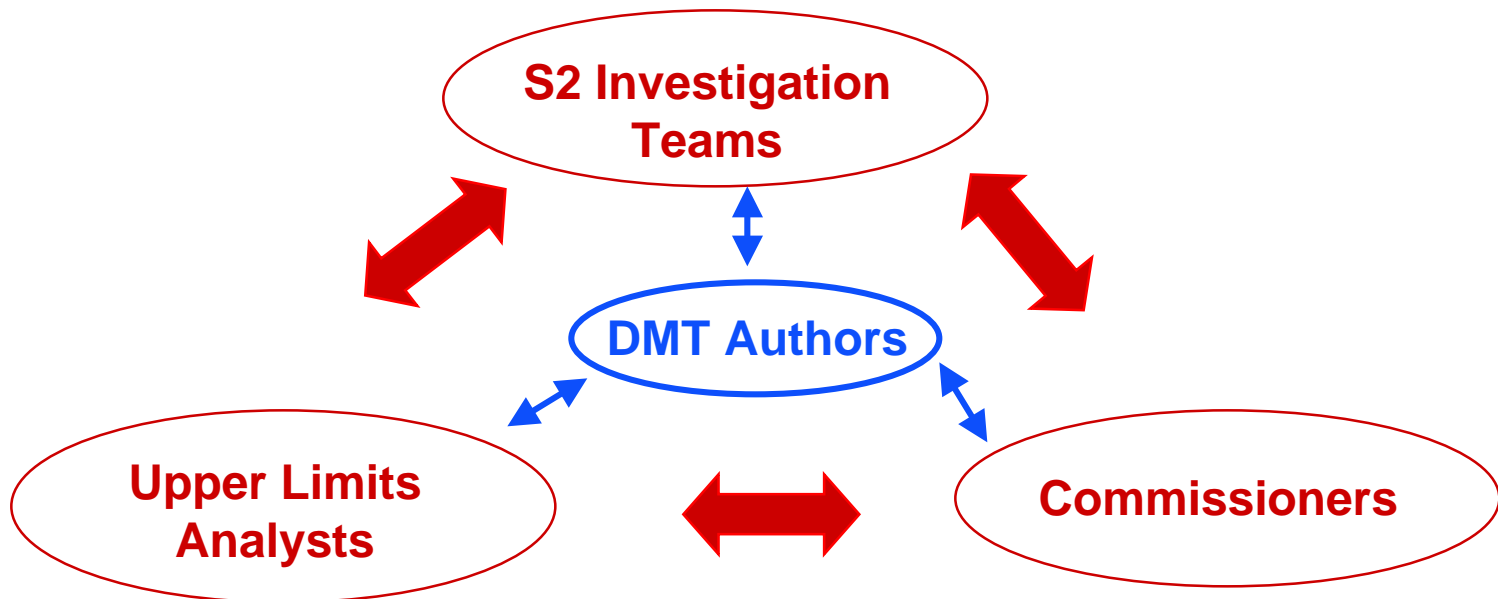
Recent Progress

- **Tremendous progress in last year on all fronts: (cont.)**
 - Online diagnostics for DAQ / CDS state / LDAS
(thanks to DaveB, Chethan, PeterSh, Greg, Igor)
 - Coupling of online calibration with astrophysical analysis
(thanks to PatrickB, Jolien, Duncan)
 - Online feedback from astrophysical searches
(thanks to Duncan, AlanWe, Laura)
 - Pool of scimon experts expanded dramatically in S2

Worries...

Despite this progress, there are long-term worries:

- S2 Investigators, upper limits analysts, and commissioners need to do better in **closing the loop**:



Worries...

Closing the loop:

- Need more systematic studies of artifacts:

Compilation → Cataloguing → Identification

Most important artifacts: **Frequent Glitches & Strong Lines**

Biggest problem: **Manpower** (no shortage of tools to use!)

Unambiguous glitch identification would help justify *a priori* vetoing of epochs in burst and inspiral searches

Glitch and line identification would aid commissioners in reducing noise and aid DMT authors in devising/refining monitors

Worries...

Closing the loop:

- **Commissioners should look at data-run figures of merit between runs (like the inspiral range!)**
- **DMT authors should talk to commissioners to learn how to make monitors more useful during / between runs, and commissioners should talk to authors!**
- **Upper limits analysts should tell commissioners what instrumental troubles limit them most, including noise floor (e.g., stochastic figures of merit for different $\tilde{\Omega}(f)$ shapes)**

Worries...

Related worry:

- **More scientists needed at the site:**
 - » **Still more than an order of magnitude to go to reach design, and progress is getting harder**
 - » **Postdocs & graduate students in residence could help enormously both in creating software tools for commissioning and in improvement of data characterization → DMT potential has only begun to be tapped!**
 - » **Unauthorized advertisement: The DMT is a user-friendly environment for algorithm development on real data. An observatory is a good place to meet the experts who know what all those auxiliary channels mean...**

Worries...

Another worry:

- **Must (eventually) enter a continuous-data-taking mode**
 - » **Detchar and Upper Limit groups must respond accordingly:**
 - Ongoing characterization and analysis, in time to allow intervention, if needed
 - More automation needed in many places
 - But also more scientists looking at results
 - » **Scimon shifts more burdensome: 24/7 scimon staffing impractical(?)**
 - Start relying on single-shift / day monitoring? Remote shifts?
 - Demands better alarms, better instructions, more knowledge than we have now
 - Demands more stable interferometers
(H1 in S2 may be a good model to study)

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This meeting

Lots of activity:

38 presentations

(detchar, detchar/asis)

Looking forward to interesting reports!