



Virgo Detchar

status report

Florent Robinet for the Virgo detchar group

Advanced Virgo noise characterization

- characterize Adv. Virgo sub-systems (noise, environment...)
- interaction with commissioning

Data monitoring

- monitor the detector
- provide monitoring tools for the collaboration

Transient noise investigation

- study detector's glitches
- provide data quality input for searches

Spectral noise investigation

- study spectral features
- provide data quality input for searches

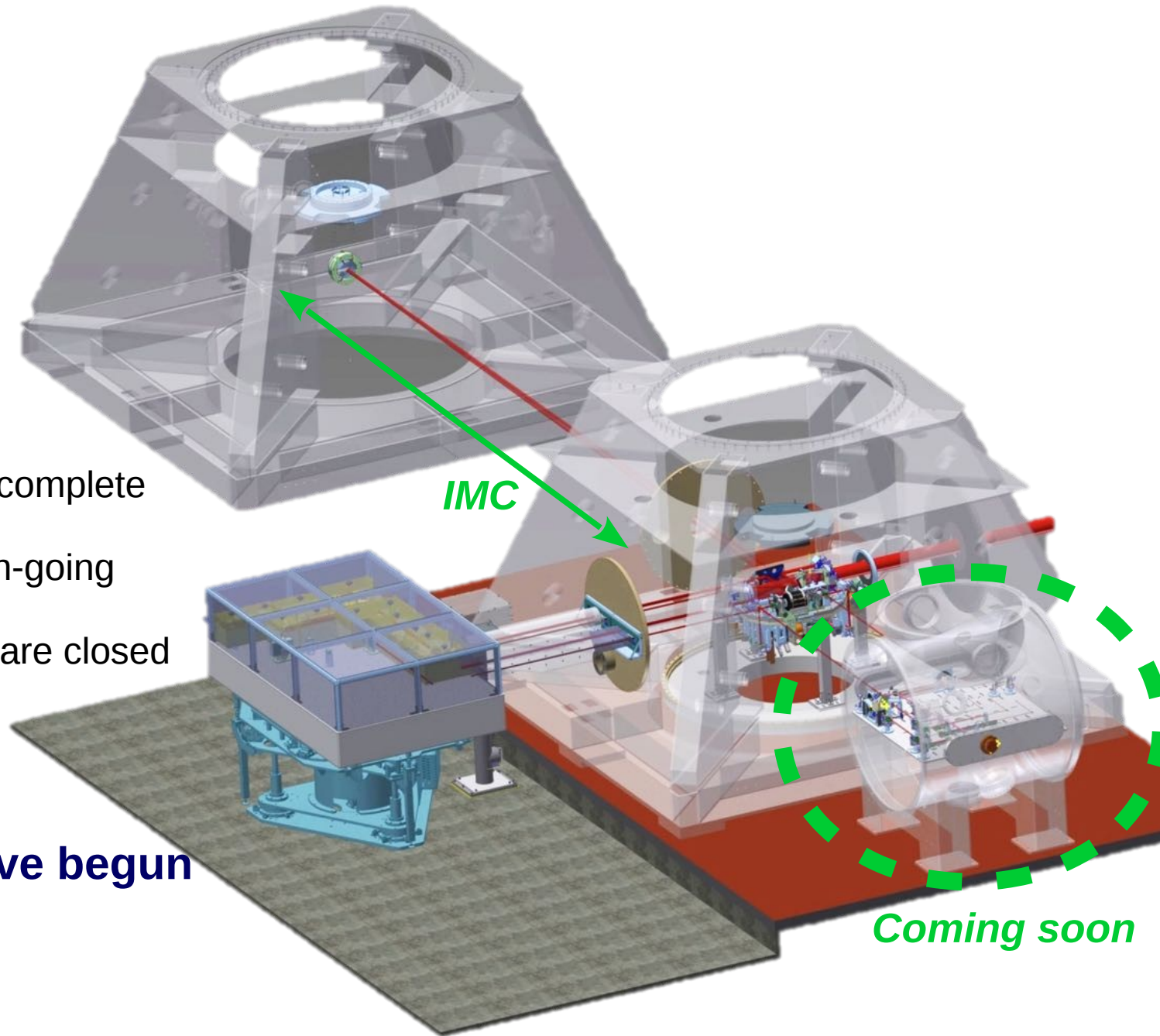
Scientific run data quality

- data-quality shifts
- data-quality checks for high-confidence GW events / GW alerts

PRIORITY!

- Injection system almost complete
- IMC commissioning is on-going
- IMC is locked / all loops are closed
- See Eric Genin's talk

Detchar activities have begun



01 02 03 04 05 06 07
08 09 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

October 2014
01 02 03 04 05 06 07
08 09 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

November 2014
01 02 03 04 05 06 07
08 09 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

December 2014
01 02 03 04 05 06 07
08 09 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

January 2015
01 02 03 04 05 06 07
08 09 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
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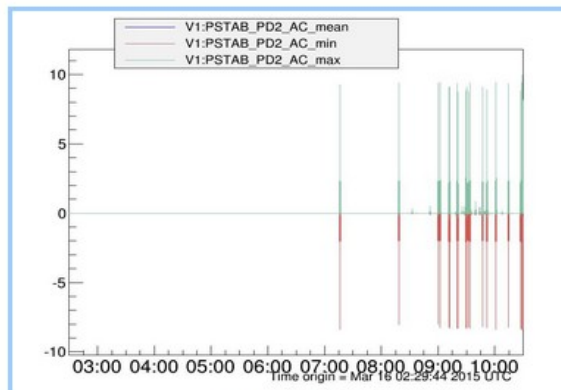
February 2015
01 02 03 04 05 06 07
08 09 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28

March 2015
01 02 03 04 05 06 07
08 09 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

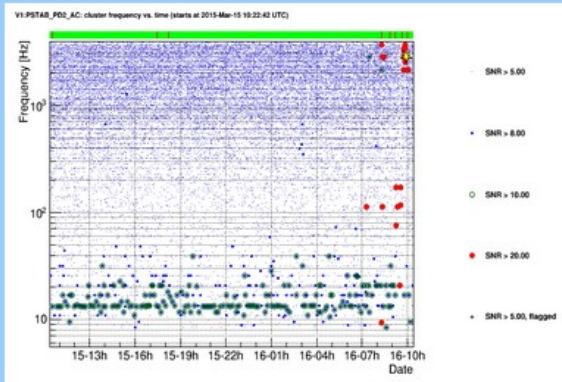
Hours of the day : [00](#) [01](#) [02](#) [03](#) [04](#) [05](#) [06](#) [07](#) [08](#) [09](#) [10](#) [11](#) [12](#) [13](#) [14](#) [15](#) [16](#) [17](#) [18](#) [19](#) [20](#) [21](#) [22](#) [23](#)

Summary plots

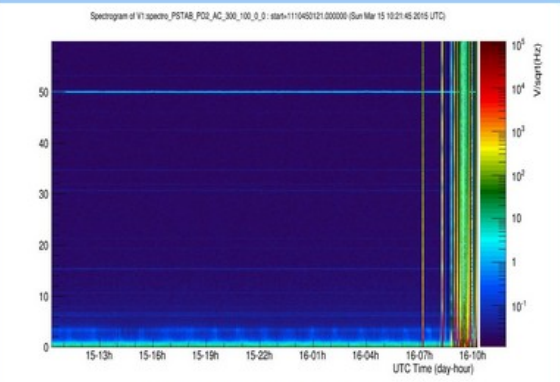
[Last 7 days](#)
[Last day](#)
[Last hour](#)
[Short archive](#)



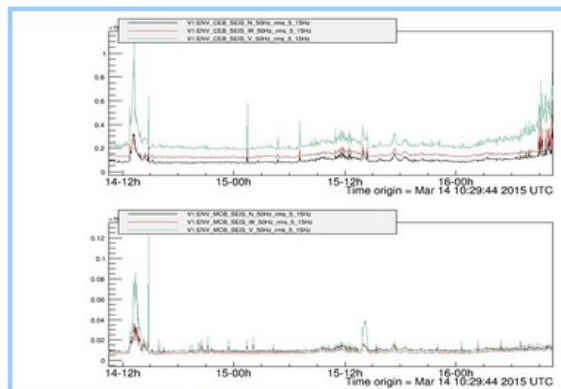
[Injection status](#)



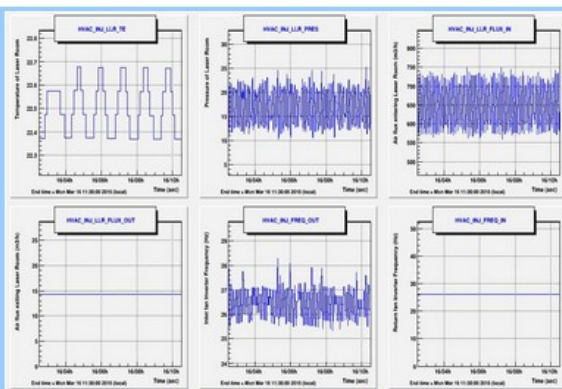
[Glitches summary](#)



[Spectrograms summary](#)



[Environment status](#)

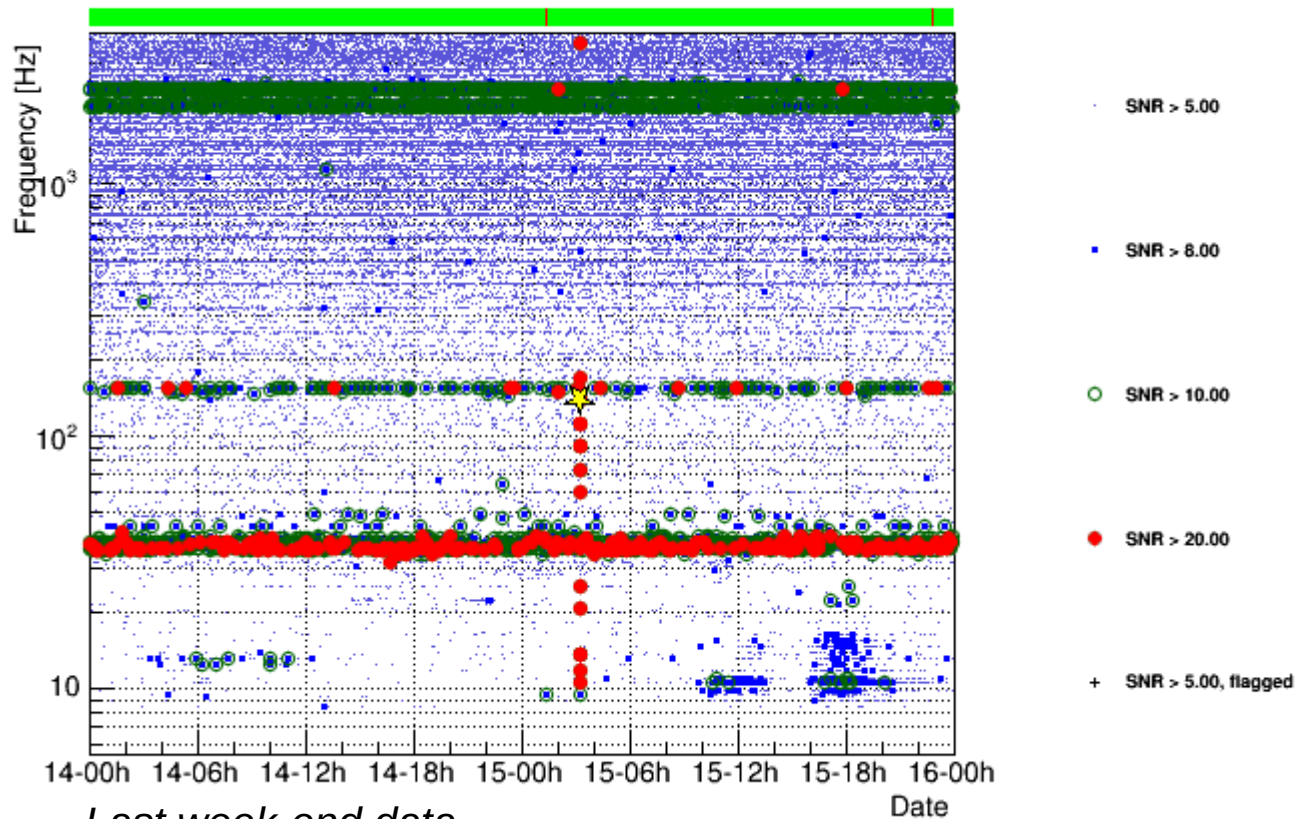


[Infrastructure status](#)

- The Virgo subsystems and environment are continuously monitored by “MonitoringWeb” (~ summary pages + ligo_dv)
- Glitches, spectrograms, trend data, flags, band-RMS...

Omicron glitches in the Error signal used to control the reference cavity

V1:INJ_RFC_REFL_I: cluster frequency vs. time (starts at 2015-Mar-14 00:00:00 UTC)

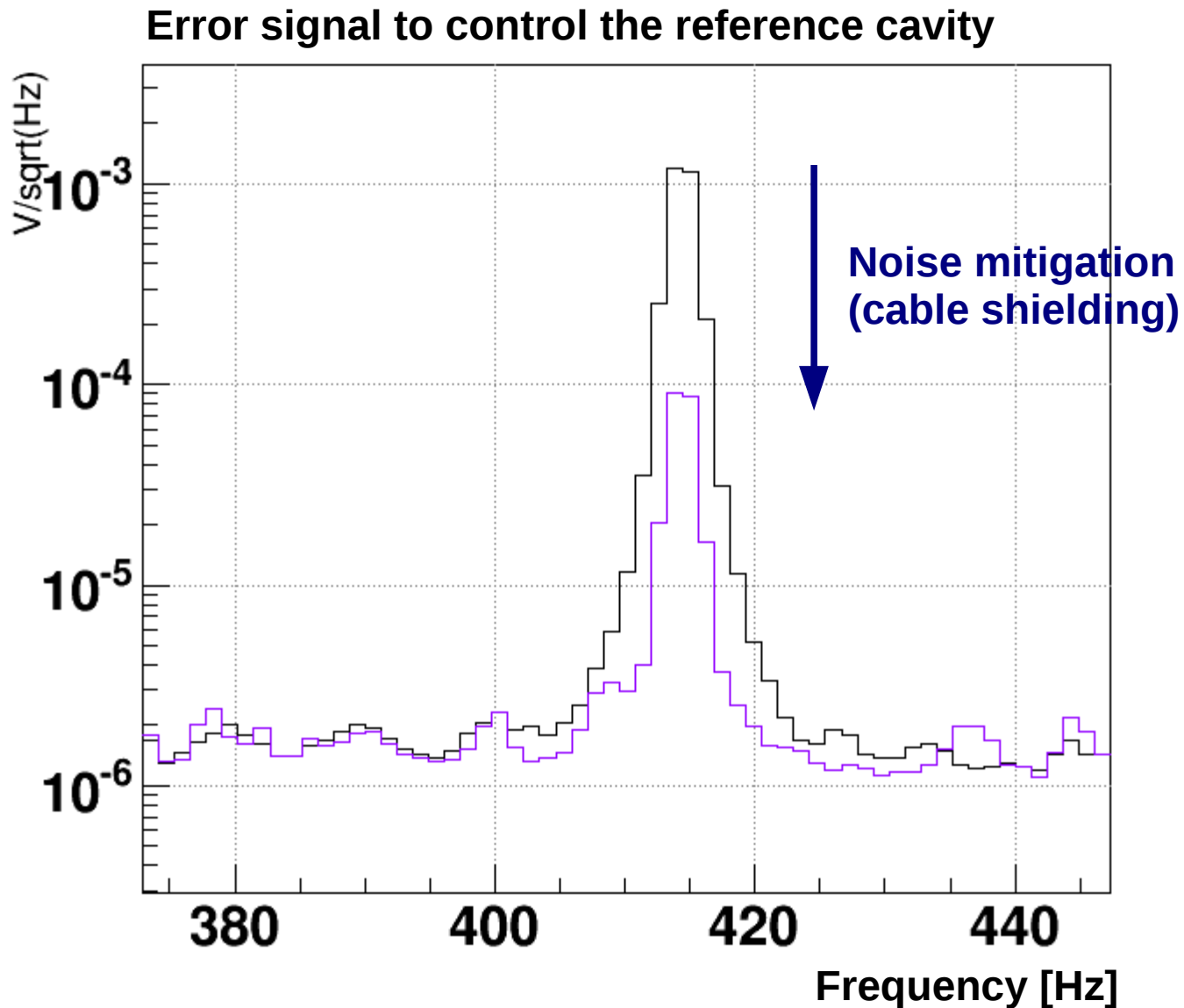


*Last week-end data
(IMC is locked)*

Current investigations:

- Laser power stabilization
- Laser frequency stabilization

RF noise injection → identify noise entry points (cables...)



- Support to the commissioning effort: data should be systematically scrutinized.
- Virgo detchar cannot afford a “sub-system lead” organization *a la LIGO*
- Some detchar shifts will begin at the end of this month:
 - a team of 2 shifters (glitch/spectral) will investigate data quality for one week
 - continuous noise investigation
 - run detchar investigation tools
 - interaction with commissioning
 - weekly report
- Keep up with the installation of new sub-systems
- First, detchar experts, then, open to the collaboration
- Documentation effort, user-friendly tools
- This shift system will evolve towards shifts for the future Virgo science runs

Definition of new data quality products for searches

- **simplify, simplify, simplify! Optimize, optimize optimize!**
- Limit the use of generic data quality input: **one search = one set of data quality input**
- For example, for transient searches, only 2 inputs:
 - One list of valid segments to run your analysis,
 - One list of veto segments for your analysis
- online analyses: 1 state vector + 1 veto channel (/pipeline and @100Hz) in the frames
- offline analyses: Science segments in DQSEGDB + a set of tools to build optimized vetoes for your analysis

Channel database

- new database to save channel parameters (description, sampling etc...) in preparation

DQSEGDB

- Virgo sub-system status flags will soon be uploaded

Online noise budget

- standardize the parameter storage/access
- development of a framework to produce a low-latency noise budget