

Data Quality Investigation

LIGO-G030182-00-E

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Livingston, March 18, 2003

Data Quality Investigation

- Monitor interferometer performance & noise.
- Summarize noise levels, glitch rates, etc.
- Select data quality criteria.
- Generate segments for different running modes

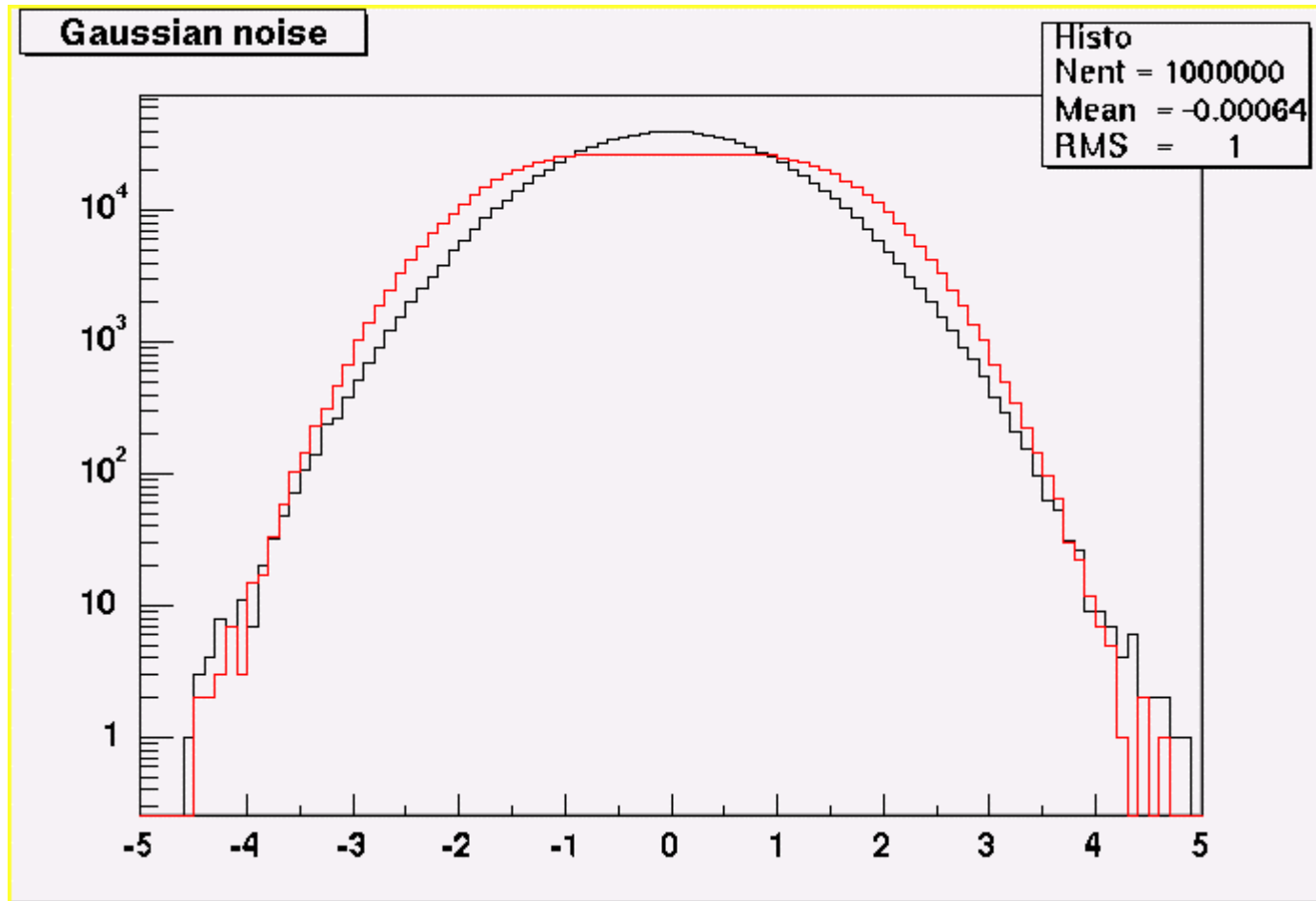
Data Quality Monitoring

- Data quality monitor running online
 - Narrow (20%) band RMS: 30 bands from 26Hz - 8kHz on channels Xn:LSC-AS_Q, Xn:IOO-MC_F, Xn:LSC-POB_Q and Xn:LSC-REFL_I.
 - Broad band RMS (10-100Hz, 100-200Hz, 200-400Hz, 400-1kHz, 1kHz-7kHz) on Xn:LSC-AS_Q only.
 - Glitch rates (4σ & 6σ thresholds, 100Hz & 500Hz high-pass filters) on AS_Q, MC_F, REFL_I, POB_I, POB_Q, DARM_CTRL, MICH_CTRL, PRC_CTRL
 - Very narrow bands around line features (1st, 2nd harmonic of violin modes, BS roll mode, etc).

Data Monitoring (cont'd)

- Generates trends of all calculated values (RMS, glitch rates)
- All quantities served for display by dmtviewer e.g. on Figure-of-Merit displays.

What do the 4σ Glitch Rates Mean?



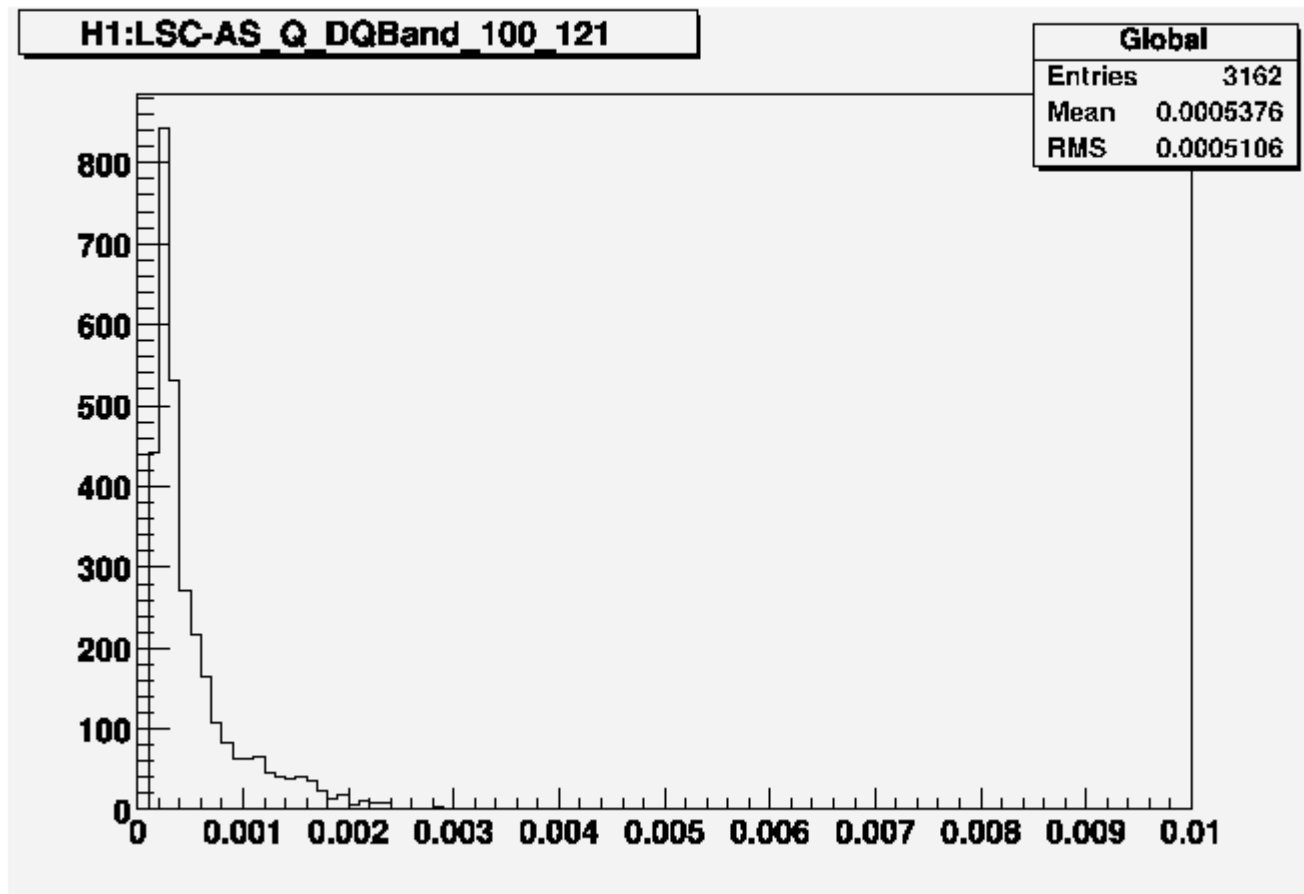
Black - Pure Gaussian

Red - Gaussian ($\sigma=1$) + $2*\sin(2\pi 100t)$

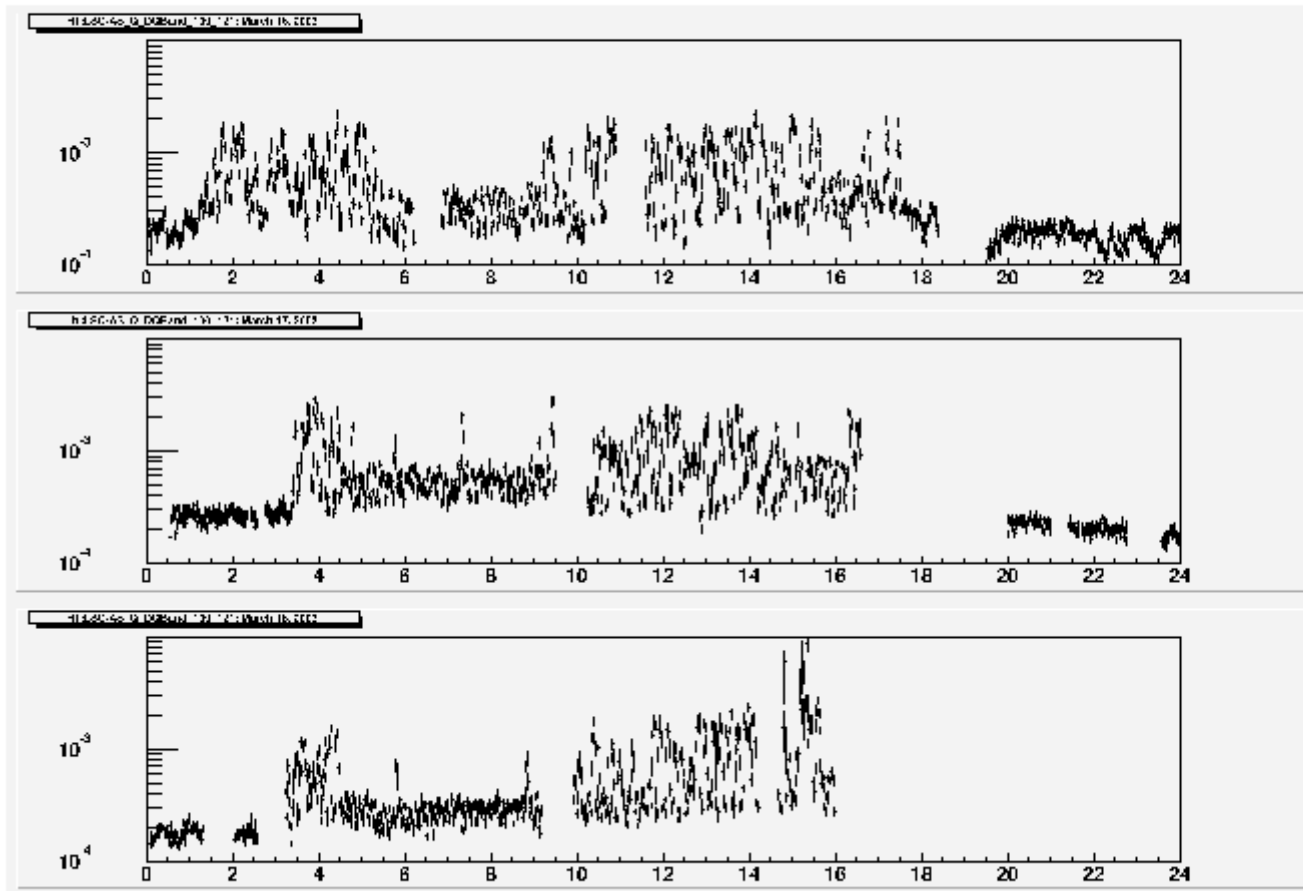
Data Quality Summaries

- 12-hour summaries available from dmtviewer viz Figure of Merit displays
- 3-day summaries at LHO available at http://blue/gds/monitor_reports/DataQual/3daysummary

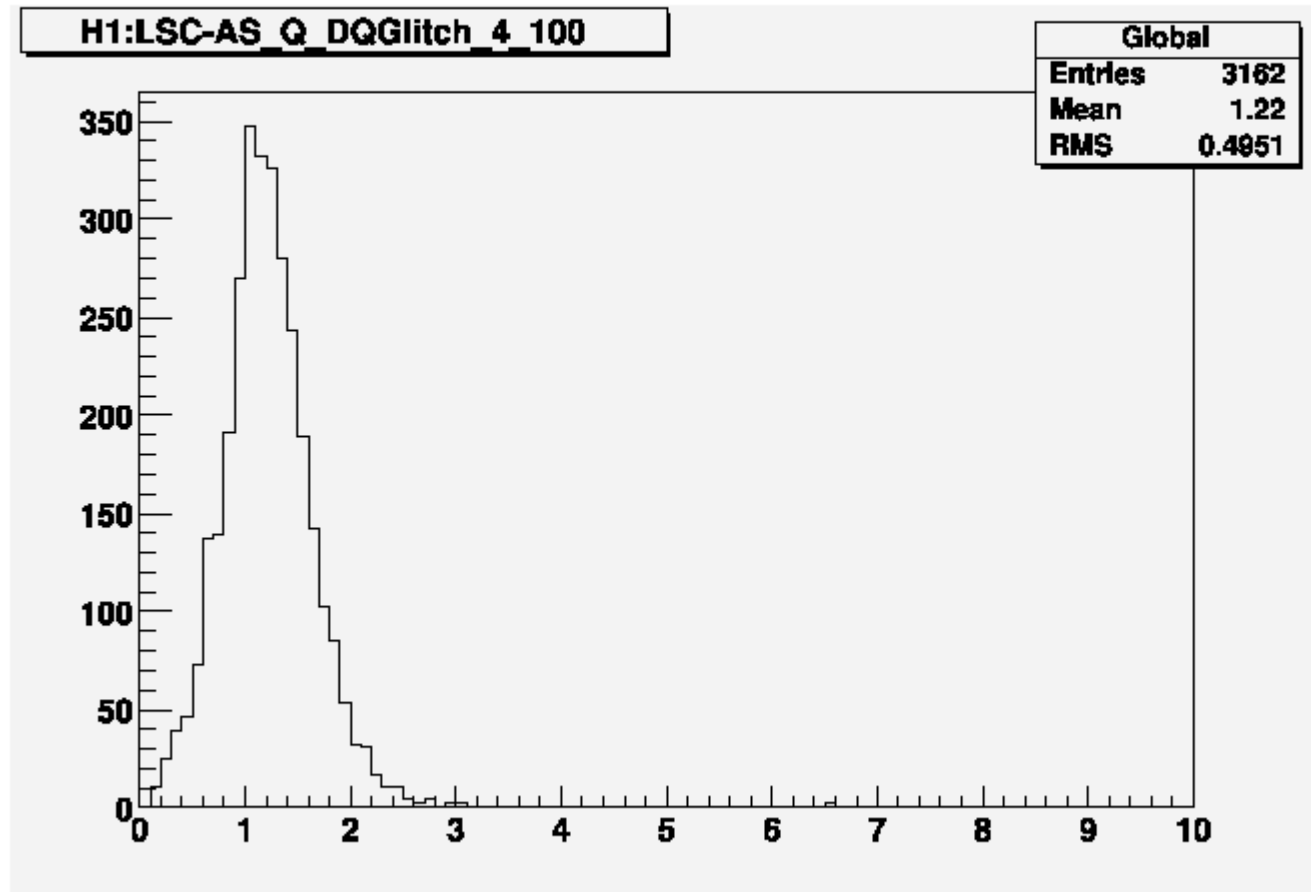
Summary RMS Histogram



Summary RMS Series

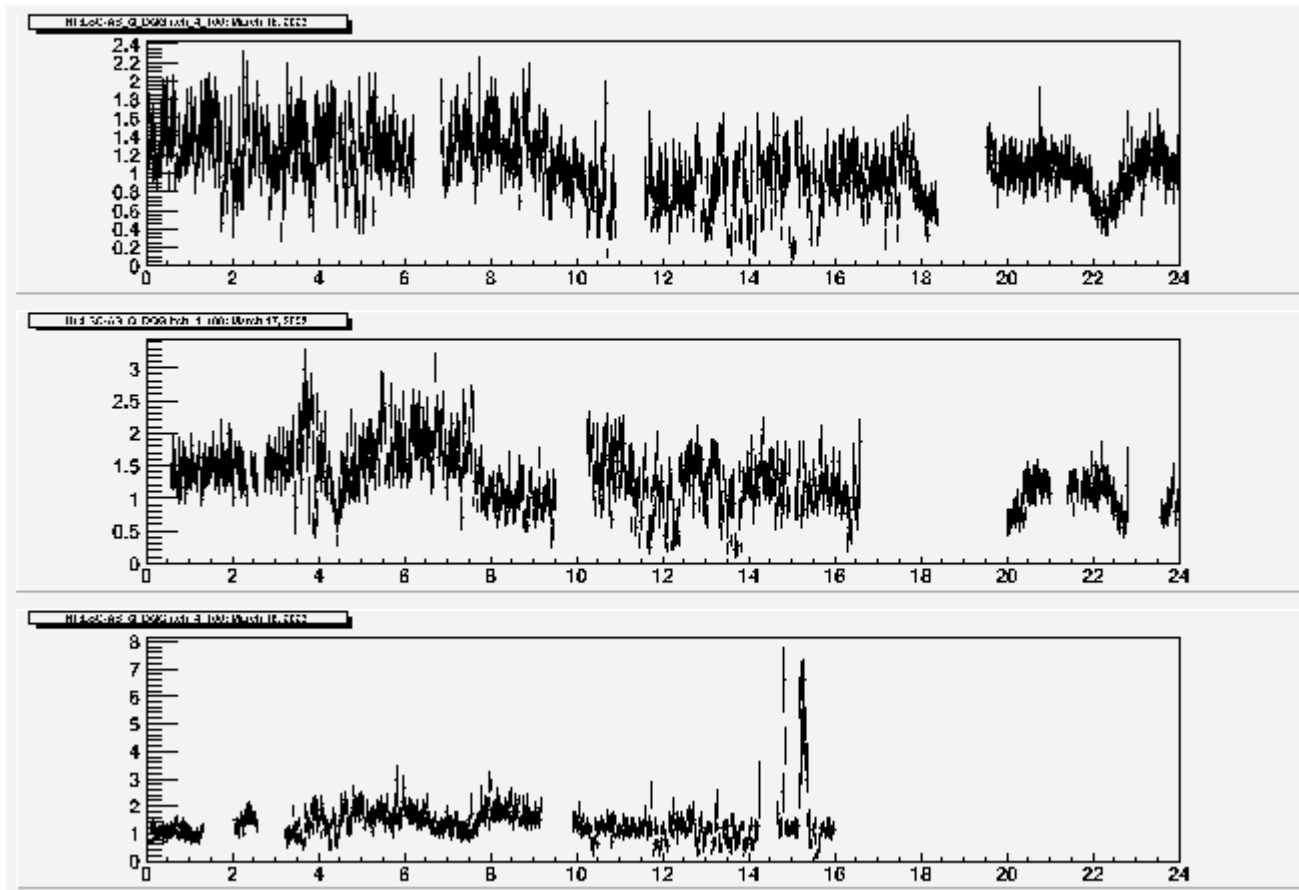


Glitch Rate Histogram



Glitch Rate Time-Series

H1:LSC-AS_Q 4σ 100Hz h.p. filter glitch rate



Glitch Rate Summary

H1:LSC-POB_I 4 σ 500Hz h.p. filter glitch rate

