

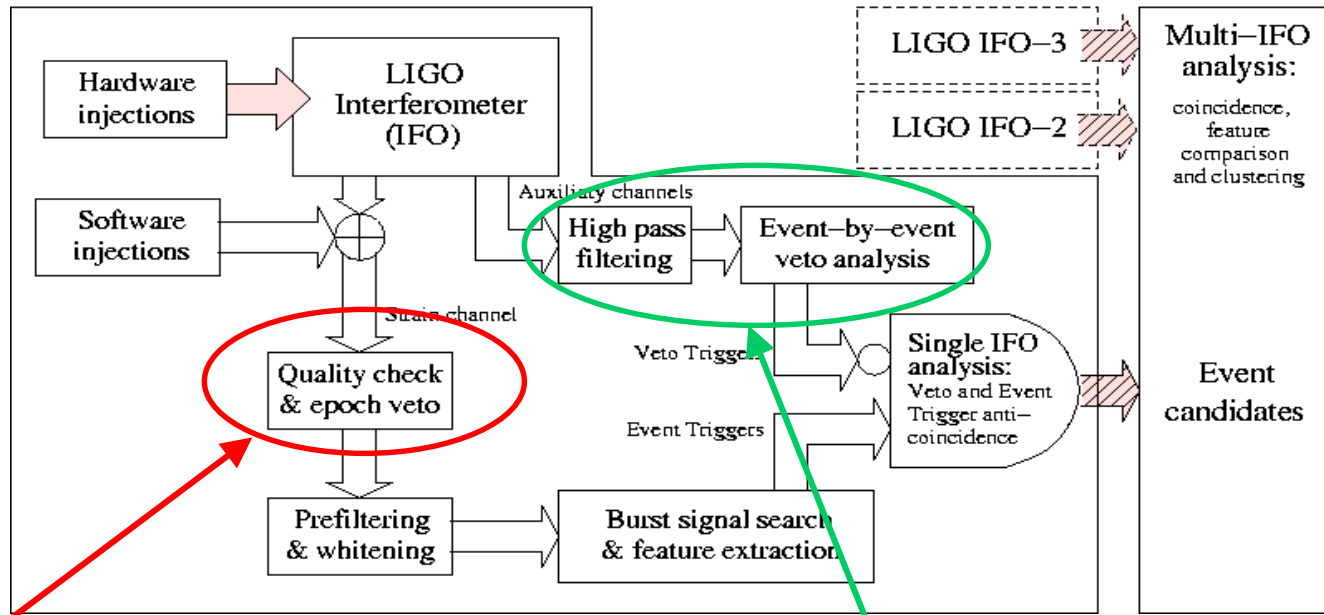
S2 Analysis Plans of the Burst Working Group

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- Several lines of analysis were (internally) proposed:
 - » 15 contributions were put forward either as end-to-end analysis plans or ways of doing specific parts of the analysis
 - » Presented and discussed in a 3 hour telecon on May 9, 2003
- Main goal of this presentation:
 - » Identify main analysis directions
 - » List analysis path and tasks that will be carried out by the group
 - » Describe a baseline analysis
 - » Where we are standing

- **Untriggered** search
 - » 'Eyes wide open' search for short duration (1-100ms) Gravitational Wave (GW) bursts with excess power in LIGO's sensitive band.
 - » Set upper limits in an S1 style on GW bursts:
 - bound in rate of events at the detectors
 - rate vs strength exclusion plot for specific waveform model
 - » Detect serendipitous signal.
- **Triggered** search
 - » Search for GW bursts in association with GRB's.
- **Modeled waveform** search
 - » Supernovae
 - » Black Hole ringdowns
- **Coincidence analysis with TAMA**
 - » Extend an untriggered search to 4-fold coincidences.

S2 Analysis Path



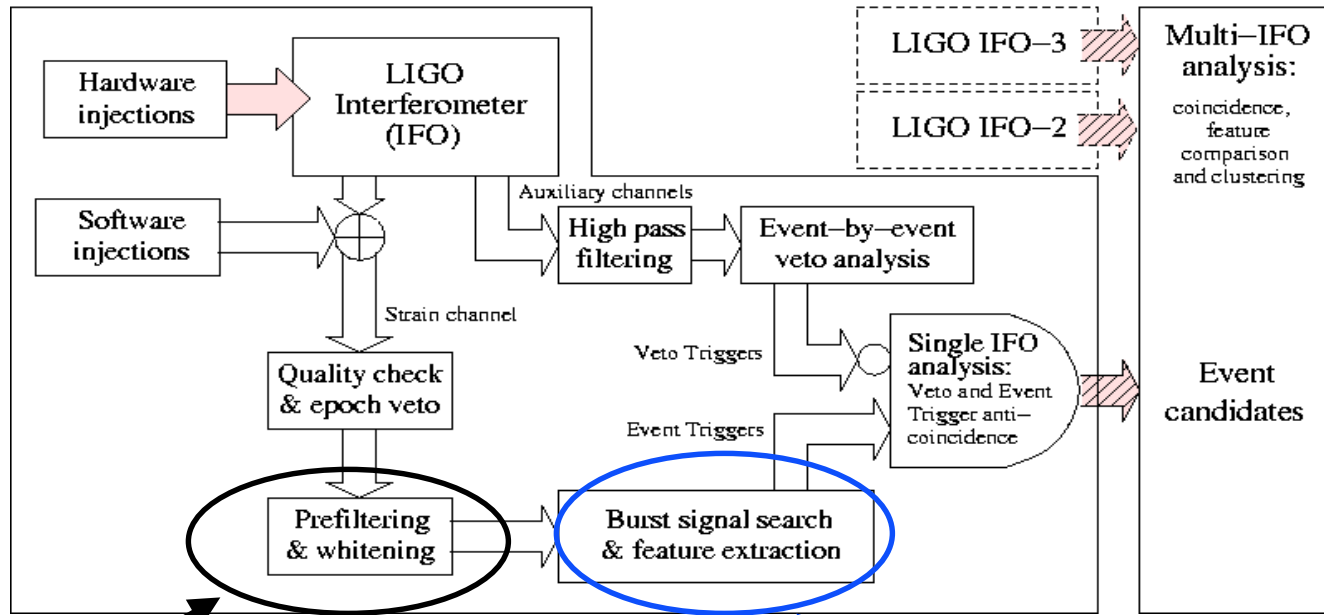
• Data Quality:

- » Identify data that do not pass quality criteria
 - Band Limited RMS (BLRMS)
 - Glitch rates from diagnostic channels
 - Calibration quality

• Veto Analysis:

- » Goal: reduce singles rates without hurting sensitivity
- » Establish correlations
- » Study eligibility of veto

S2 Analysis Path



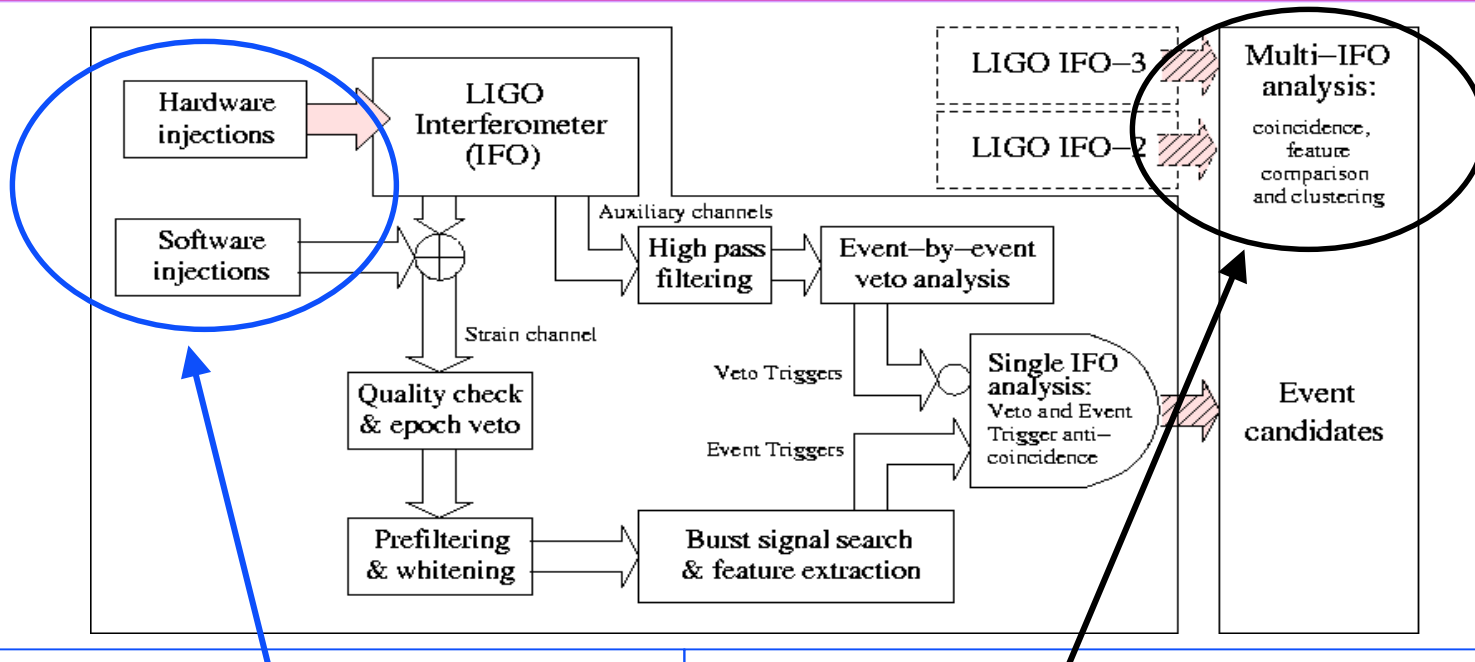
• Data Conditioning:

- » High pass filtering and whitening using **adaptive** predictive algorithms
- » **Dynamically** trained during the run

• GW Burst TriggerGenerators:

- » TFCLUSTERS (Fourier domain)
- » Slope (Time domain)
- » Excess **Power** (Fourier domain)
- » **WaveMon** (Wavelet domain)
- » **Blocknormal** (Time domain)
- » Bursts common feature extractor (new DSO)

S2 Analysis Path



• Simulations:

- » Use to optimize ETGs
- » Employ **astrophysically** (and non) **waveforms** to measure efficiencies of the search
- » Employ **template** matching to confront to optimal detection

• Coincidence Analysis:

- » **Tighter** time and frequency coincidence
- » Use of **amplitude matching** among IFOs
- » **Waveform consistency**: perform a fully **coherent analysis** on candidate events

Where we are standing

- All tasks are under way
 - » First pass through the S2 data in ~real time followed by a more careful re-run on the playground
 - » Instruments more stationary during S2
 - » Data quality and vetoes currently being addressed
 - » ETG tuning and efficiency measurement in progress
- Emphasis on
 - » integrating Detector Characterization analysis output to our working group and vice versa
 - » work together with the inspiral group on data quality, vetoes and calibrations

