



E7:
An Instrument-builder's
Perspective

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From the August LSC Meeting:

- ✓ • “E6” run before the end of 2001 (December for two full weeks)
- ✓ » At least one interferometer at each observatory with at least one interferometer in full recycled configuration
- ✓ » Goal of significant locked coincidence data, but sensitivity not guaranteed
- ? » Analysis goal: sensitivity curves (February), full analysis (April)
- ✗ » if not successful, repeat the E6 run in January 2002



Detector Status – Last LSC Meeting

- All in-vacuum installation complete
 - » Continuing installation and commissioning of control systems
- LHO 2 km interferometer
 - » Locks in recycled configuration for ~1 hour times
 - » Sensitivity $\sim 10^{-17}$ rms
 - » Working to improve both
- LLO 4 km interferometer
 - » Locked as Michelson with F-P Arms
 - » Problem with seismic noise at low frequencies
- LHO 4 km interferometer
 - » Commissioning just beginning



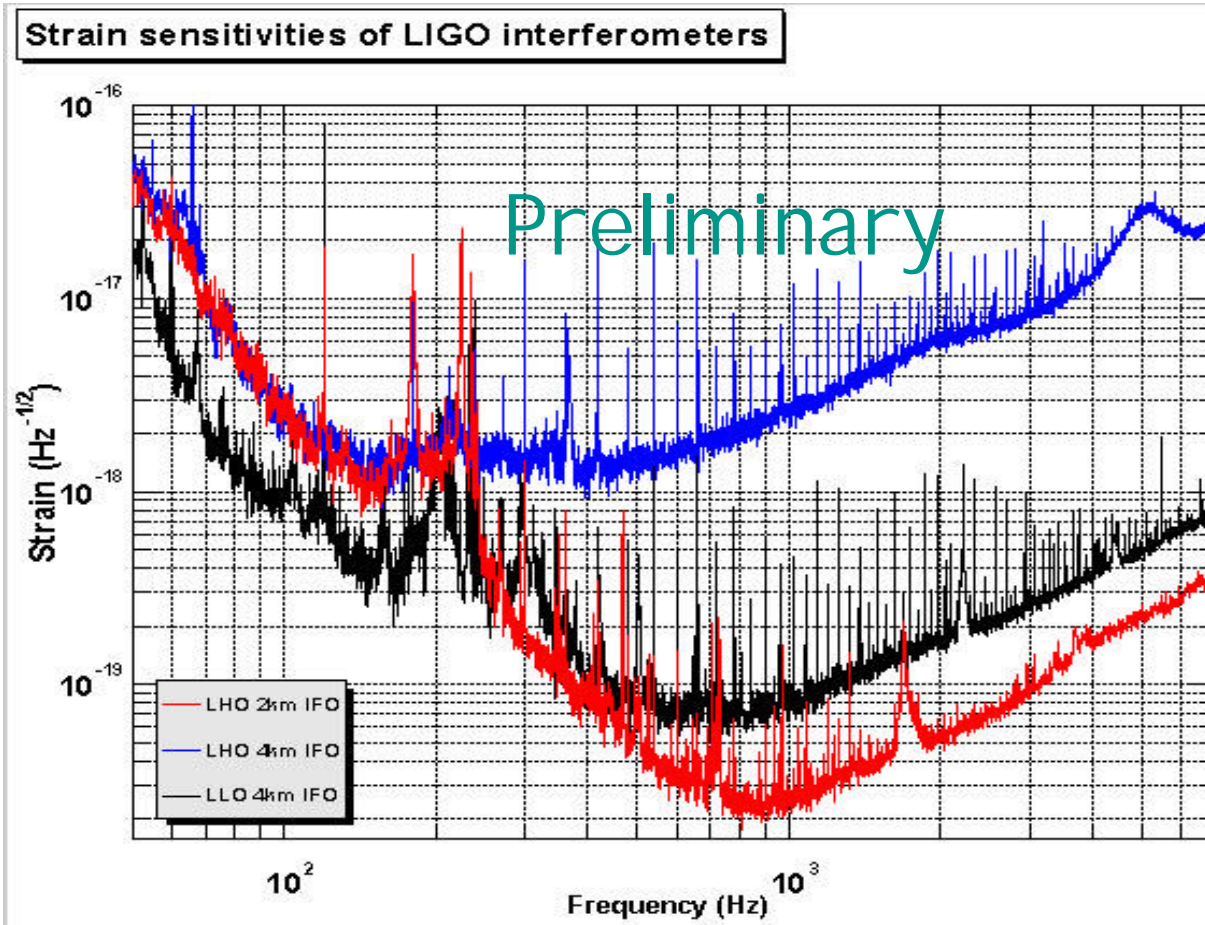
Projected Performance – Last LSC Meeting

- ✓ • *Expect* LHO interferometers to be operating in recycled configuration
 - » Depends on success with digital suspension controllers
- ✓ • LLO may operate in recycled, or possibly just recombined, mode
 - » Final decision about 1 November
 - » Analog suspension controllers -> different channel names, noise, filtering, limits, etc.
- ✓ • Expect (but do not guarantee!) up to x10 improvement over already achieved
- ✓ • Most PEM channels will be operational (though of lower priority than main interferometer components)



Sensitivity?

- Hope to take “Preliminary” off soon
- Snapshot in time – not representative of typical behavior
- Does not represent time-domain search sensitivities

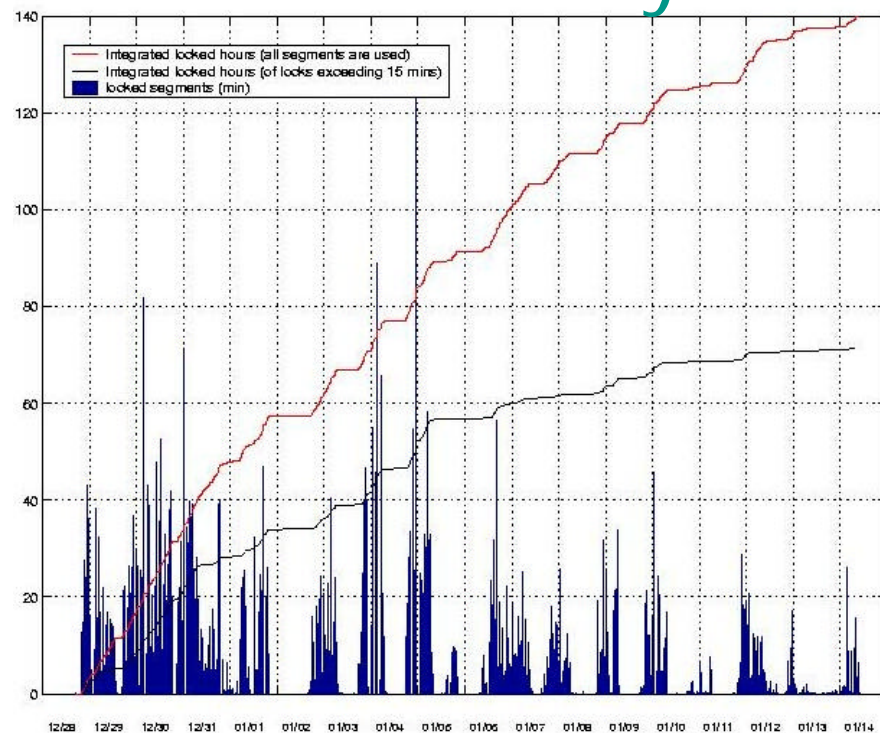




Duty Cycle?

- ~60% for each detector individually
- ~20% triple coincidence (Reminder: Science Requirement Document goal is 75%)
- Optimist:
 - » First three days came close to this goal
- Pessimist :
 - » This was only 2 weeks! What happens when we try for months?
 - » Un-recycled is an easier configuration to lock

Preliminary





Assessment: *The Good, the Bad and the Ugly*

- Noise:
 - » E7 spectral density shows steady progress from earlier levels
 - » Too many bursts, too many lines, too much variability
- Duty Cycle:
 - » E7 had extended locked sections (~10 hr) for LHO 2 km
 - »and extended (>24 hr) downtimes
 - » Clearly demonstrated the need for seismic remediation at LLO
- Analyzability:
 - » Successfully collected and archived the data
 - » Need to better capture the state of the machine
 - » Missing channels, confusing channel names, uncertain calibration
- Operations:
 - » Dedication of the operators, enthusiasm of the scientific visitors
 - » Need ability to read DMT monitor output from trend frames
 - » Need for clearer procedures, guidelines for trouble shooting, etc.