SenseMonitor: Plans for S4+

Patrick J. Sutton

LIGO-Caltech

SenseMonitor

- SNR-based figure-of-merit monitor for the LIGO IFOs
- Real-time range estimates:
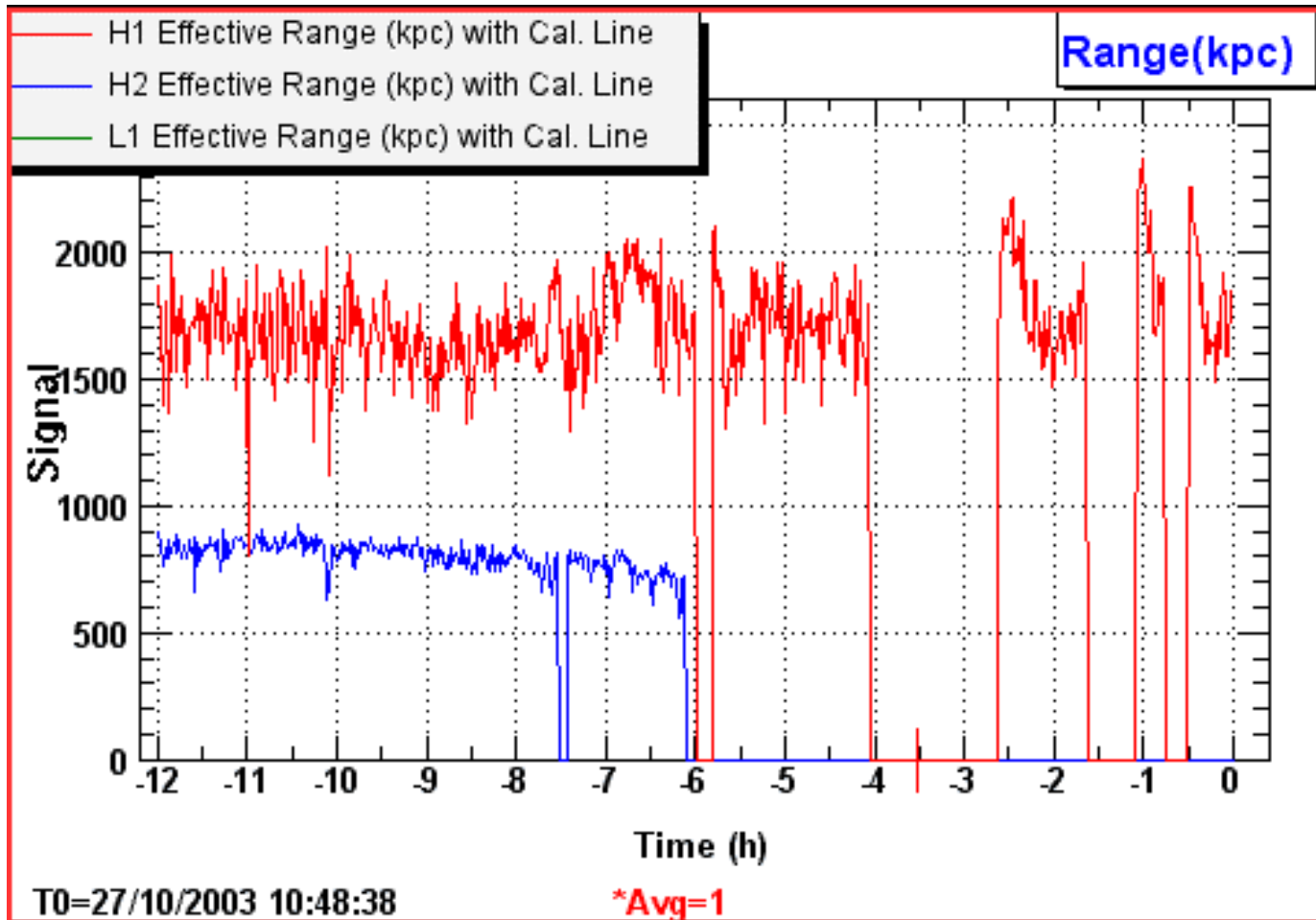
chirp mass   **angle factor**   **inspiral signal**

$$r = \left(\frac{5 \mathcal{M}^{5/3} \theta^2}{96 \pi^{4/3} \rho_0^2} \int_{30\,\text{Hz}}^{1400\,\text{Hz}} df\, \frac{f^{-7/3}}{S_h(f)} \right)^{1/2}$$

SNR threshold   **strain noise**
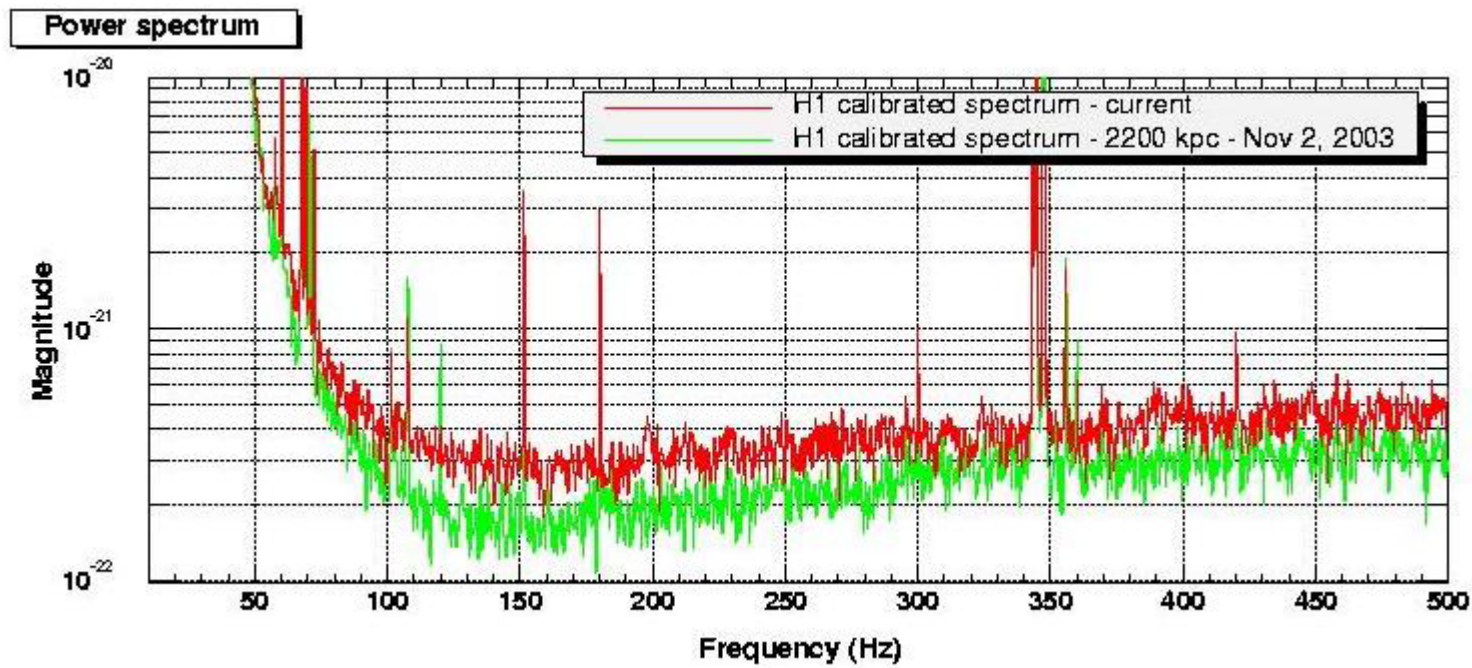
- SenseMonitor uses $M_1 = M_2 = 1.4\ M_o$, $\rho_0 = 8$.
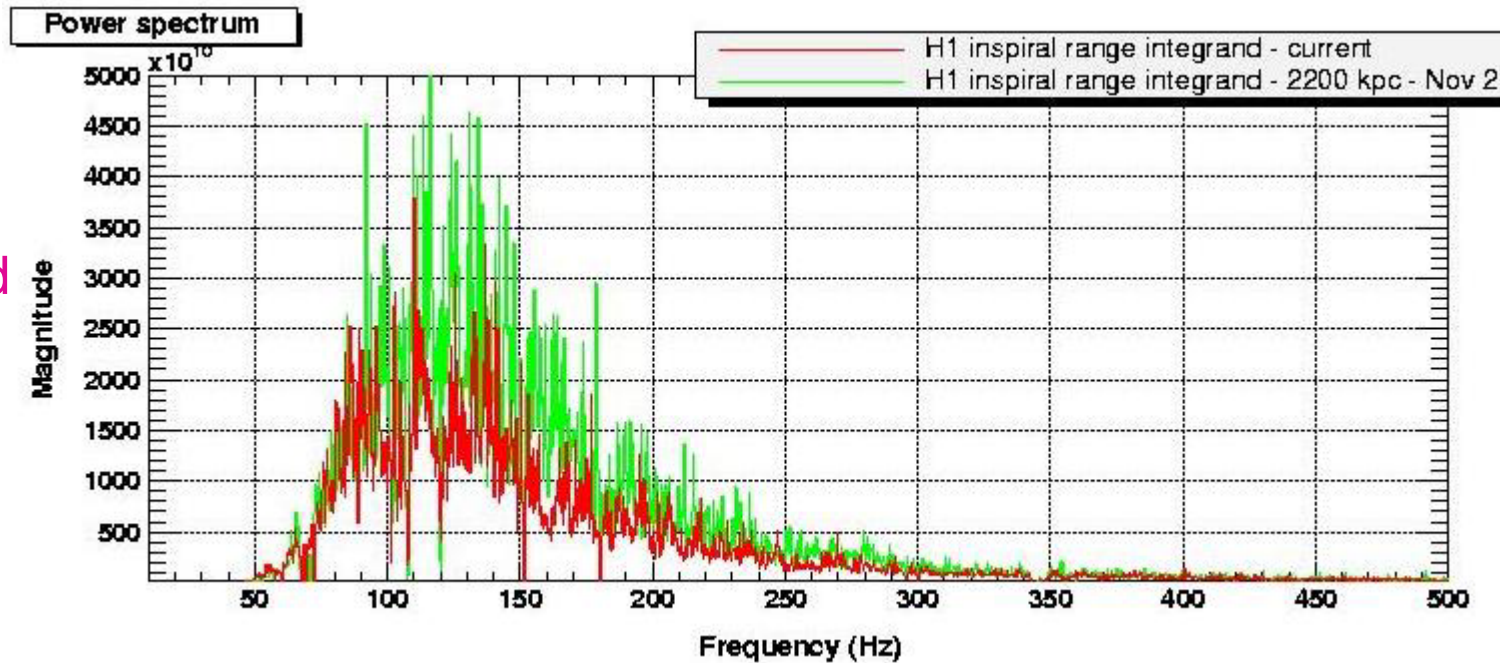
SenseMonitor in S3

range estimates, calibrations

strain noise
spectrum S(f)

range integrand
$f^{-7/3}$ / S(f)

What's new for S4

By popular demand…

- Implement new calibration classes.
  - » makes use of monitor much easier to run

- Additional FOM: range to $10M_o$-$10M_o$ binary black-hole inspiral
  - » samples very-low-frequency portion of noise spectrum ($f < \sim 200Hz$)

Summary

- See previous slide.