ISOTROPIC UPDATE

AUG 14, 2017

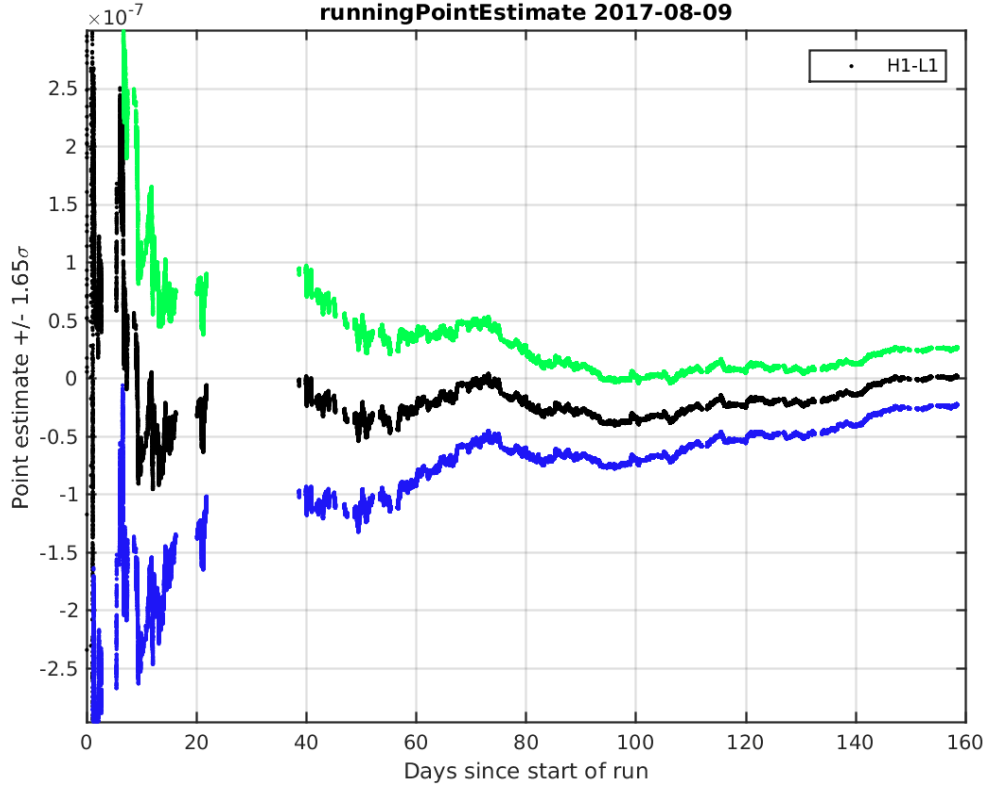
Rich Ormiston & Andrew Matas

DATA / DQ

- Performed a run from June 09, 2017 - July 27, 2017 and combined the results with the previous run from Nov 30, 2016 - May 08, 2017
- Applied 1s time shift
- Used 52s segments with 1/4 Hz bins
- Removed CAT 1 vetos from CBC veto definer file
- Same notch list as previous run (See Duo's coherence tool results: H1, L1)
- Applied delta sigma cut by combining $a = -5, 0, 3$ in supercut method

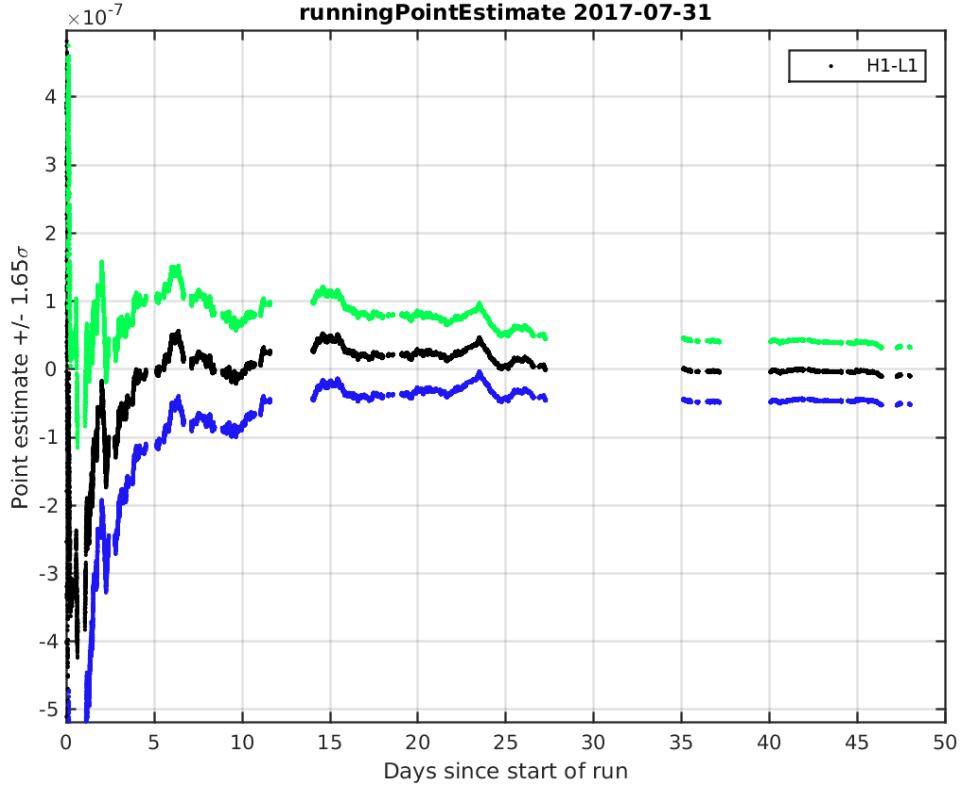
RESULTS I

- Run from Nov. 30 - May 08
- $Y = (0.20 \pm 1.53) \times 10^{-8}$
- $SNR = 0.13$
- sigma bias factor: 1.03
- No hubble constant applied
- Link to standard plots



RESULTS II

- Run from June 09 - July 28
- $Y = (-1.04 \pm 2.61) \times 10^{-8}$
- $SNR = -0.40$
- sigma bias factor: 1.03
- No hubble constant applied
- Link to standard plots



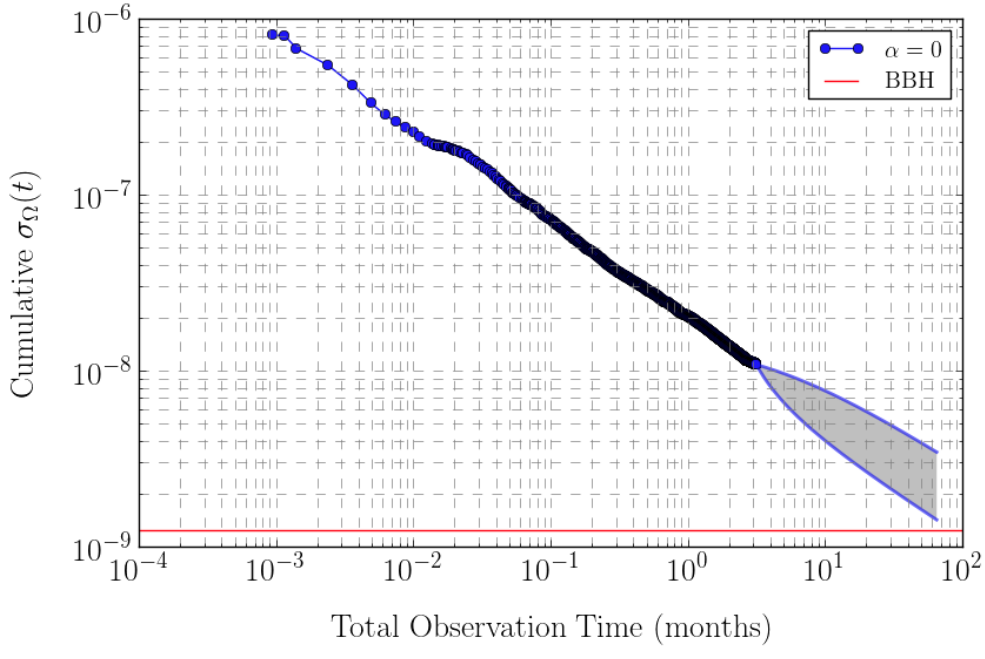
COMBINED RESULTS

- $Y = (-0.12 \pm 1.32) \times 10^{-8}$
- Total time analyzed after

supercut: 80.4 days

- Previous run time after

supercut: 62.6 days



- Expect sigma $\sim \sqrt{T}$

$$\rightarrow \sigma_{tot} = \sigma_{obs_1} \sqrt{\frac{T_{obs_1}}{T_{tot}}} = 1.31 \times 10^{-8}$$

- Good agreement with Stochmon sigma projection

PRESENT O2 RESULTS SUMMARY

Spectral Index α	$Y/10^{-8}$	$\sigma/10^{-8}$	SNR
0	-0.12	1.32	-0.09
2/3	-0.34	0.98	-0.35
3	-0.27	0.15	-1.80

SENSITIVITY OF O1 + O2

- With O2 run $\sim$ 7/8 completed,

$\rightarrow \sigma_{O2} \sim \sqrt{\frac{7}{8}} 1.32 \times 10^{-8} = 1.23 \times 10^{-8}$

- Hubble scaling: $\sigma_{O2} = \frac{\sigma_{O2}}{h_0^2} = 2.67 \times 10^{-8} \qquad (h_0 = 0.68)$
- For O1, $\sigma_{O1} = 5.9 \times 10^{-8}$

$\rightarrow \sigma_{O1+O2} = \left(\frac{1}{\sigma_{O2}^2} + \frac{1}{\sigma_{O1}^2} \right)^{-1/2} = 2.43 \times 10^{-8}$

- Improved by a factor of $\frac{\sigma_{O1}}{\sigma_{O1+O2}} = 2.4$

FOLLOWING UP

- The results for the $\alpha = 3$ case

are strange and we have done

some preliminary checks.

- Removing outliers around

90Hz changes SNR dramatically

- Will continue to investigate