

## Review Summary

- S6 Einstein@Home All-Sky “Bucket” CW search  
**Investigators:** Maria Alessandra Papa, Heinz-Bernd Eggenstein, David Keitel, Irene Di Palma, Reinhard Prix, Sinead Walsh  
**Reviewers:** Pia Astone, Teviet Creighton
- Semicohherent  $\mathcal{F}$ -statistic search; timebase  $90 \times 60$  hr, frequencies 50–510 Hz, spindowns as strong as  $-0.084$  Hz/yr
  - ★ Deepest search yet at those frequencies: 90% frequentist limits down to  $\sim 6 \times 10^{-24}$  in  $h_0$
  - ★ Targeted only “clean” 0.05 Hz bands (89% of spectral range); upper limits collected in 0.5 Hz bands.
  - ★ Outliers consistent with Gaussian ( $\chi^2$ ) noise.
- 17 review calls plus 3-day F2F meeting:  
<https://wiki.ligo.org/CW/S6BucketReview>

# Review Summary

- Basic  $\mathcal{F}$ -stat engine same as previous searches; review considered:  
**Data selection:** “Clean” bands selected by heuristic procedure.
  - ★ Reviewers were convinced it is reasonable, though false dismissal rate is not quantifiable.
  - ★ Excluded bands explicitly noted; may be targeted in future.
- Loudest candidate selection:**
  - ★ Reviewed new code for clustering, vetoing, ranking candidates.
  - ★ New “line-robust” statistic: Bayesian test among “signal”, “noise”, “line” hypotheses; along with legacy approximants.
- Reviewers satisfied that method and results are reasonable.

**Paper:** [LIGO-P1600156](#)

- Reviewers have signed off; open to feedback from collaboration.