Parameter-space metric of semicoherent searches for continuous gravitational waves

- Fully coherent all-sky CW searches computationally severely limited
  - » More efficient approach: **semicoherent searches**
    (Divide data set into segments, each of which is coherently analyzed, then incoherently combine matched-filtering results from all segments)

- **Central problem**: design of and link between **coarse** and **fine** template grids
  - » Previous search methods used clever, but ad hoc constructions

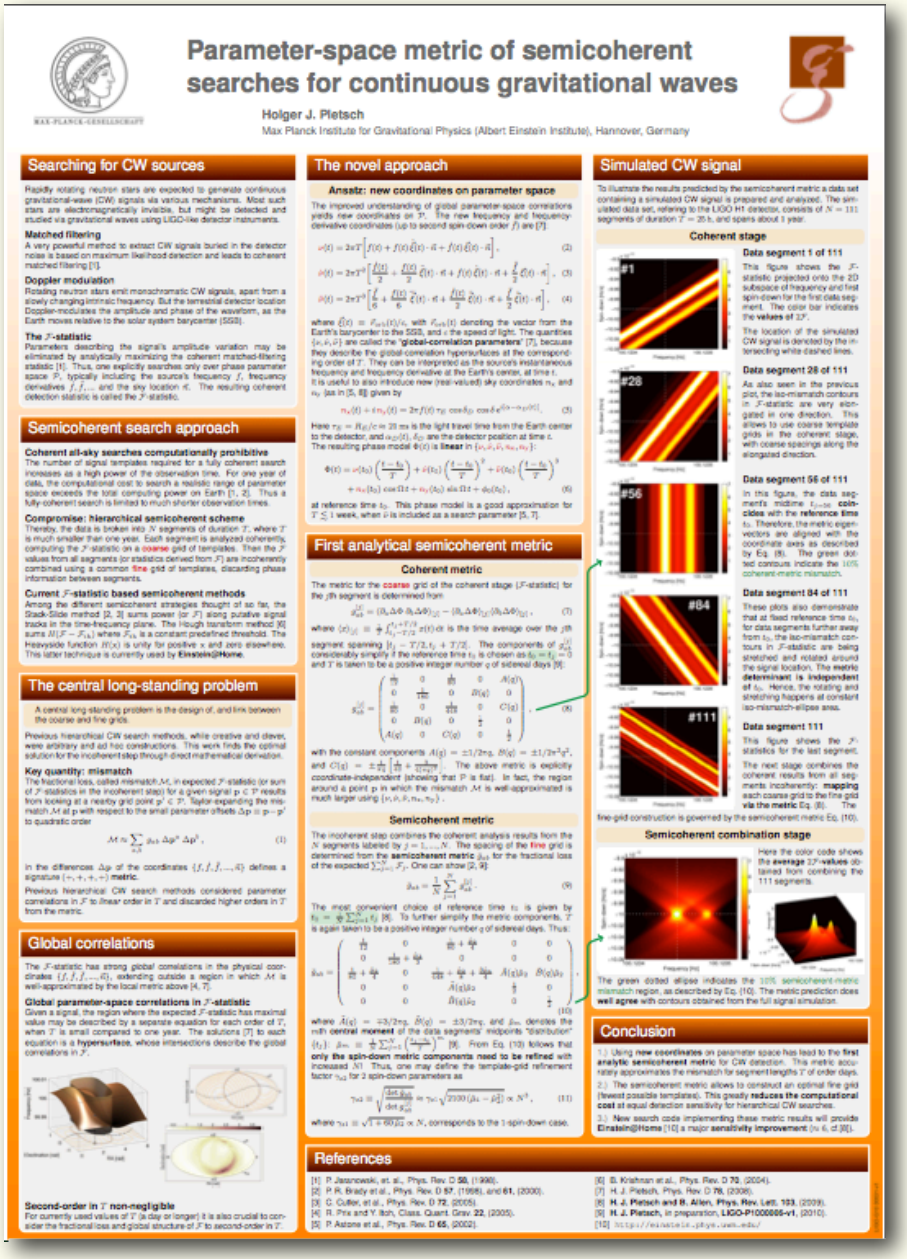
- In recent work (HP & B. Allen, PRL, 2009), optimal **solution** to the incoherent combination problem found
  - » Key aspect: **new coordinates on parameter space**

- These coordinates allow the **first analytical parameter-space metric for the incoherent combination step**.

- Given this semicoherent metric, search codes can be improved to achieve a **significantly increased sensitivity** (e.g. for **Einstein@Home**)

Parameter-space metric of semicoherent searches for continuous gravitational waves

see poster:



Parameter-space metric of semicoherent searches for continuous gravitational waves

Holger J. Pletsch

Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Hannover, Germany

Searching for CW sources

Semicoherent search approach

The central long-standing problem

Global correlations

The novel approach

First analytical semicoherent metric

Simulated CW signal

Conclusion

References