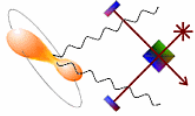


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Hough Hierarchical Pulsar Search



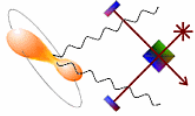
Status Report:

Hough Hierarchical Pulsar Search Code

(and some other stuff...)

Steve Berukoff
Albert-Einstein-Institut
15/03/2001

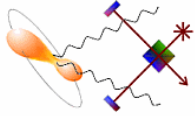
LIGO-G010117-00-Z



Code Overview

AEI code is a three-stage, hierarchical code

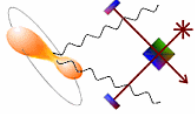
Code Stage/ Type of Code	Moniker	Input	Output
1 -- Coherent	“Demodulation” <i>Increases time baseline, corrects for modulation and spindown effects</i>	Short timescale, low resolution FFTs, parameter set <i>(timescale ≈ 1 hour)</i>	Longer timescale, medium resolution DeFTs <i>(timescale ≈ 1 day)</i>
2 -- Incoherent	“Hough Transform” <i>Identifies candidate spectra</i>	DeFT peaks, parameter set	Histogram in parameter space
3 -- Coherent	“Follow-Up” <i>High-sensitivity use of Stage 1 algorithm using Stage 2 results</i>	‘Database’ of selected peaks, DeFTs	High resolution DeFTs <i>(timescale ≈ 4 mos.)</i>



Stage 1 & 3: *Demodulation/Coherent Transform* *S. Berukoff, M.A. Papa*

- ⚡ Submitted to LAL software librarian
- ⚡ Will be included in LAL 0.7 release
- ⚡ Available for use (e.g., targeted search)
- ⚡ Work is continuing on
 - ⚡ parallel (MPI) version
 - ⚡ code optimization
 - ⚡ benchmarking

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Hough Hierarchical Pulsar Search

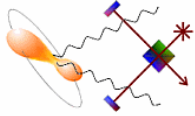


Stage 2:

Hough Transform

A. Sintes-Olives, M.A. Papa

- ⚡ 'Zooming' algorithm computationally costly, so...
- ⚡ New algorithm based on *Stereographic Projection* and *Partial Look-Up Tables*
- ⚡ Early April: Partial Look-Up Tables (C only) coding done
- ⚡ LSC August: Complete coding (C)

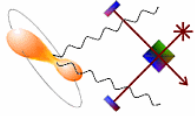


Hough Code: Synopsis

- ⚡ Stage 1 code is **complete**
- ⚡ Stage 2 code is on its way
- ⚡ Stage 3 code is **complete**

August 2001: Full Three Stage code

- ⚡ **1 spindown parameter**
- ⚡ **sub optimal tiling of parameter space**



Other CW-Related Work:

Alberto Vecchio:

- ⚡ CW source database:
 - Being LAL'd; done by summer
- ⚡ Parameter space gridding for NS binaries:
 - C (not LAL) codes complete
 - Available for summer

Curt Cutler:

- ⚡ Barycenter code:
 - C codes complete, LAL conversion underway
 - Finished package available in six weeks