LISA-France

Summary of contributions of CEA to DDPC and P&O

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Ground segment team at CEA-IRFU

Nicolas Dagoneau
Manager for the contribution of CEA to DDPC
CU L2A Technical deputy
LLAP architecture
Low-latency MBHB detection

Jean-Baptiste Bayle
CU L01 lead
Low-latency MBHB detection
Low-latency parameter estimation

Christophe Cossou
LLAP architecture
Low-latency MBHB detection

Etienne Savalle
Performance & Operation team

Antoine Petiteau
DDPC Scientist
Performance & Operation team
LLAP architecture
Low-latency MBHB detection

Tobías Liaudat
Low-latency parameter estimation

Louis Le Saulnier
Low-latency parameter estimation

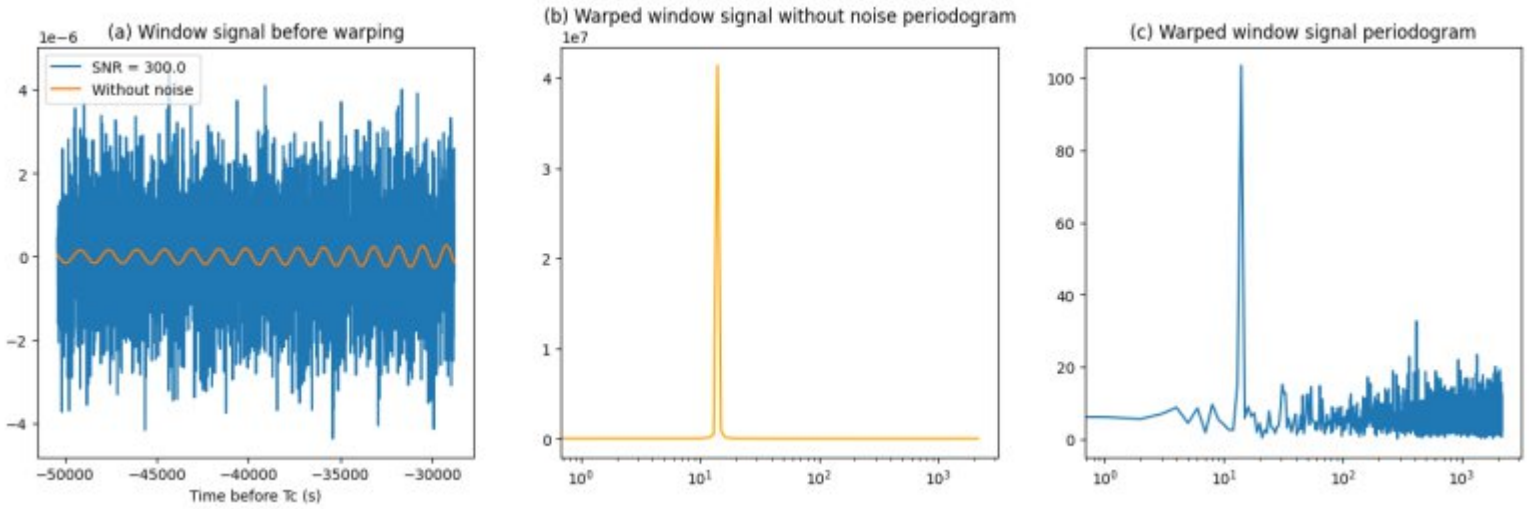
Jérôme Bobin
Data analysis expert

DDPC Contribution: L01/SIM

- Pipeline to generate science-ready TDI data from L0 (raw telemetry) data
- Used as input for the global fit and LLAP
- Mojito Light: L01 pipeline and data products delivered in December 2025
- Mojito Heady: data delivery expected between September and December 2026
- See Jean-Baptiste’s talk tomorrow!

DDPC Contribution: LLAP (detection)

- Prototype algorithm for low-latency MBHB detection
- Warps the signal to increase sparsity in the frequency space: detection
- Estimates the coalescence time
- Algorithm being tested with Mojito Light MBHBs selected by CU-L2A, results to be presented at the DDPC Workshop in June.
- New PhD student to work on this starting in October

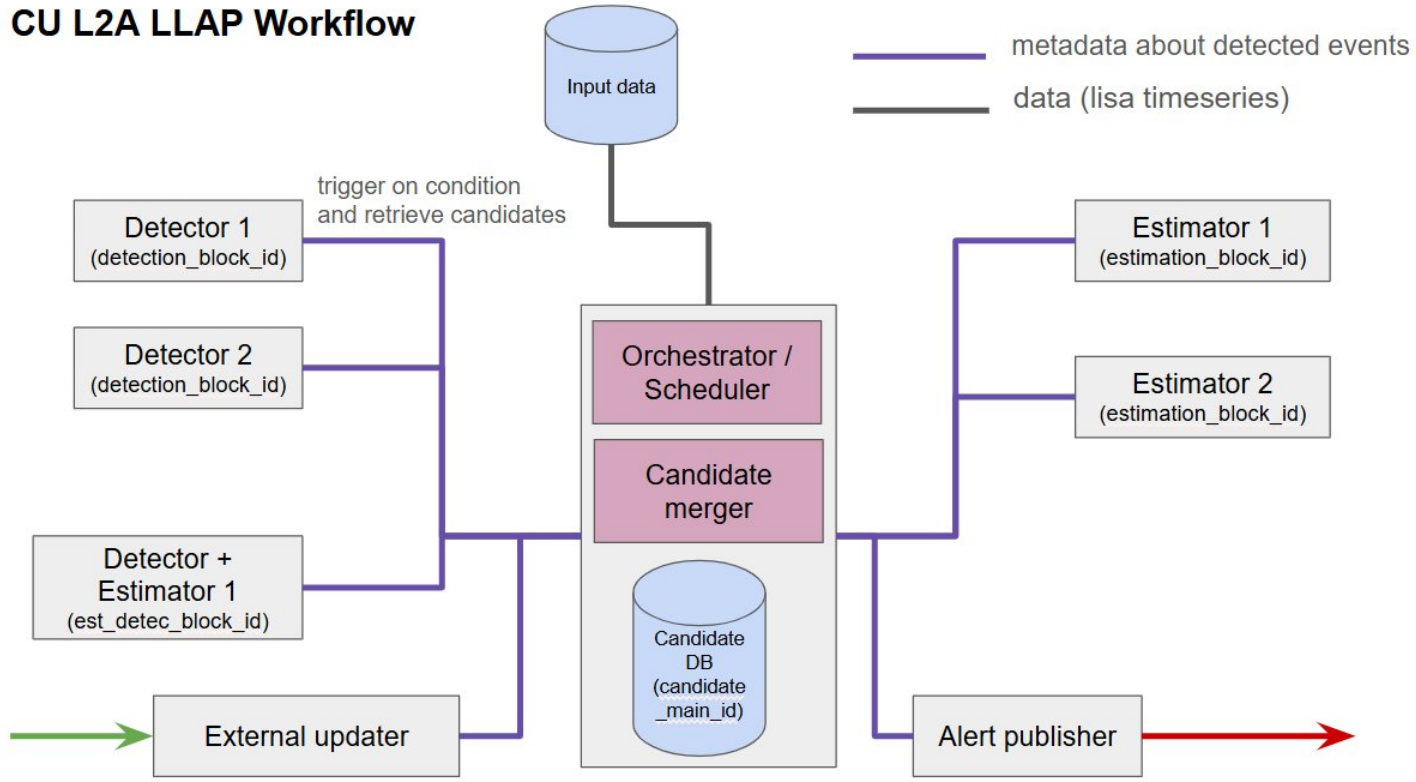


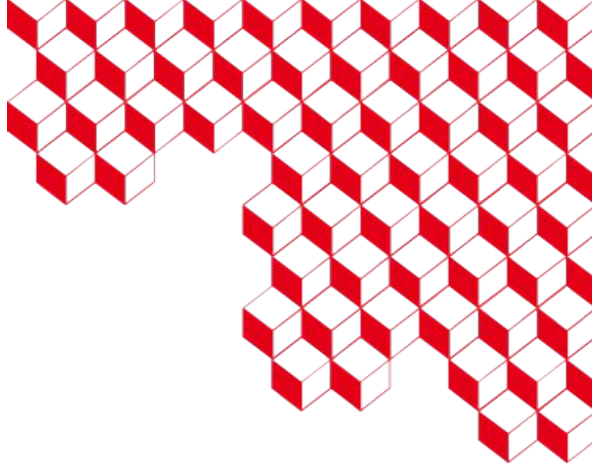
DDPC Contribution: LLAP (parameter estimation)

- Simulation based inference (SBI) pipeline for low-latency parameter estimation
- Developed and validated using self-simulated data
  - Currently using simple waveform, embedding, and models
  - Working in the time domain, using a realistic response and noise
  - Using importance sampling for the final results
  - Focused on the validation of the trained models
- To be used on Mojito Light data soon
- See Louis's talk tomorrow afternoon!

DDPC Contribution: LLAP (architecture)

- First prototype LLAP workflow designed during the last in-person CU-L2A workshop
- Introduction of concepts: detectors, estimators, orchestrator
- Some concepts may be implemented using DDPC/SOC infrastructure (Argo)





Thanks

Team member talks

Jean-Baptiste Bayle: What's new in L01?

Adrien Cogez: Detectability of the gravitational memory effect with LISA

Louis Le Saulnier: Simulation based inference (SBI) for fast parameter estimation of massive black hole binary