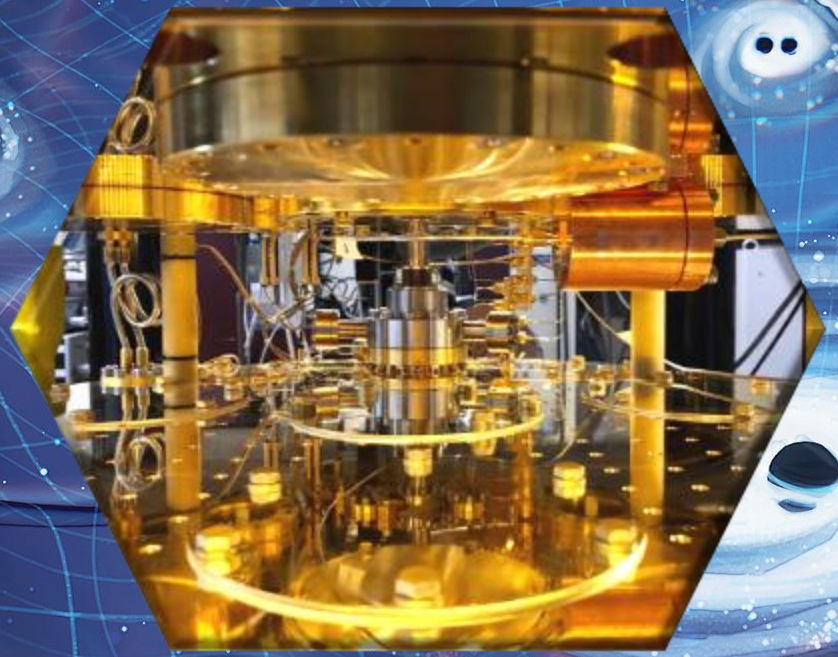
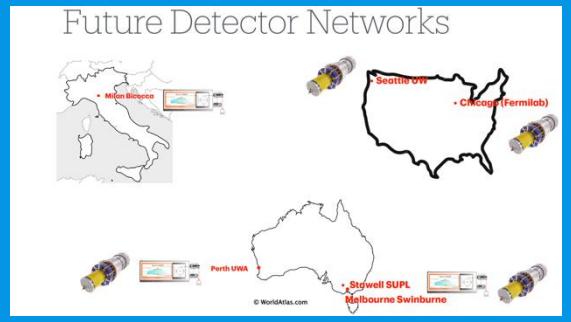
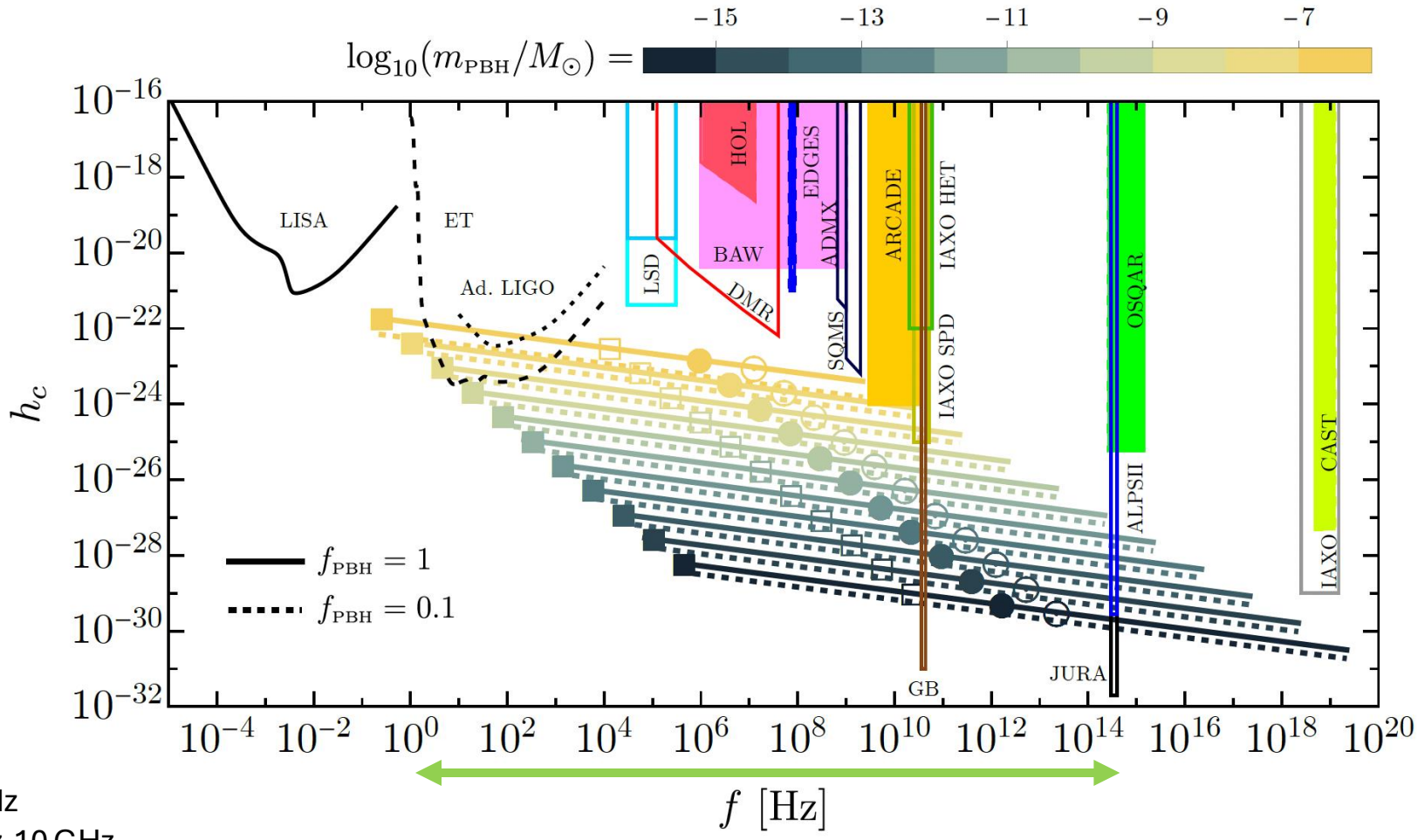
GravNet - Towards a first GravNet Joint Data Taking



Beijing (CN): Magnetometer; Hz
Chicago (US): OLS; 100 kHz
Milan (EU-IT): BAW; 1 MHz
Perth (AU): BAW, RF Cavity; 1 MHz, 10 GHz
Mainz (EU-DE): RF Cavity, Magnetom.; Hz,10 GHz
Frascati (EU-IT): RF Cavity; 100 MHz ,10 GHz
Legnaro (EU-IT): RF Cavity, e-spin; 10 GHz
Bonn (EU-DE): RF Cavity; 10 GHz
Tenerife (EU-ES): Dielectric: 10 GHz, 30 GHz
Manchester (GB): RF Cavity: 30 GHz
Abu Dhabi (AE): Dielectric; 300 THz





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Magnetometers Dielectrics

OLS RF Cavities

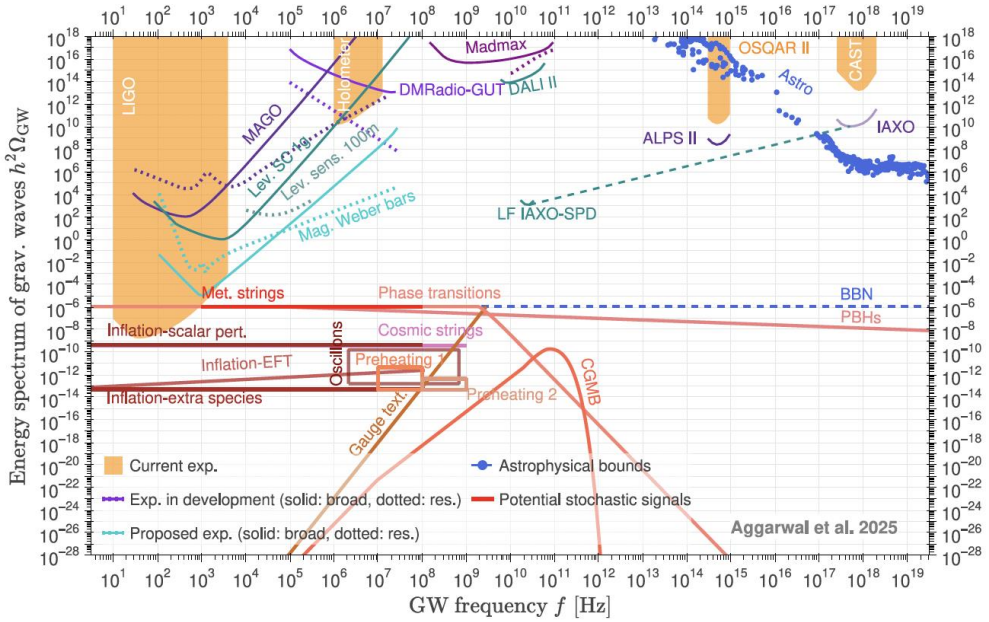
BAW

Theory

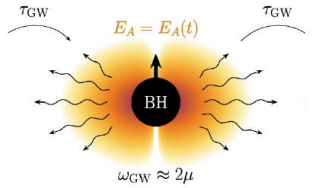
WG1. Sources and waveform production

Luca Visinelli

- **Stochastic** — Aggarwal et al. 2501.11723 [gr-qc])

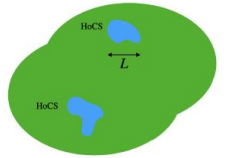


- **SR** — Tsukada et al, '20

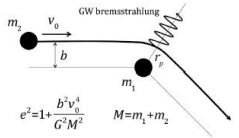


- **BBH merger** — Franciolini et al 2205.02153

- **NS/NS mergers** — Casalderrey et al. 2210.03171



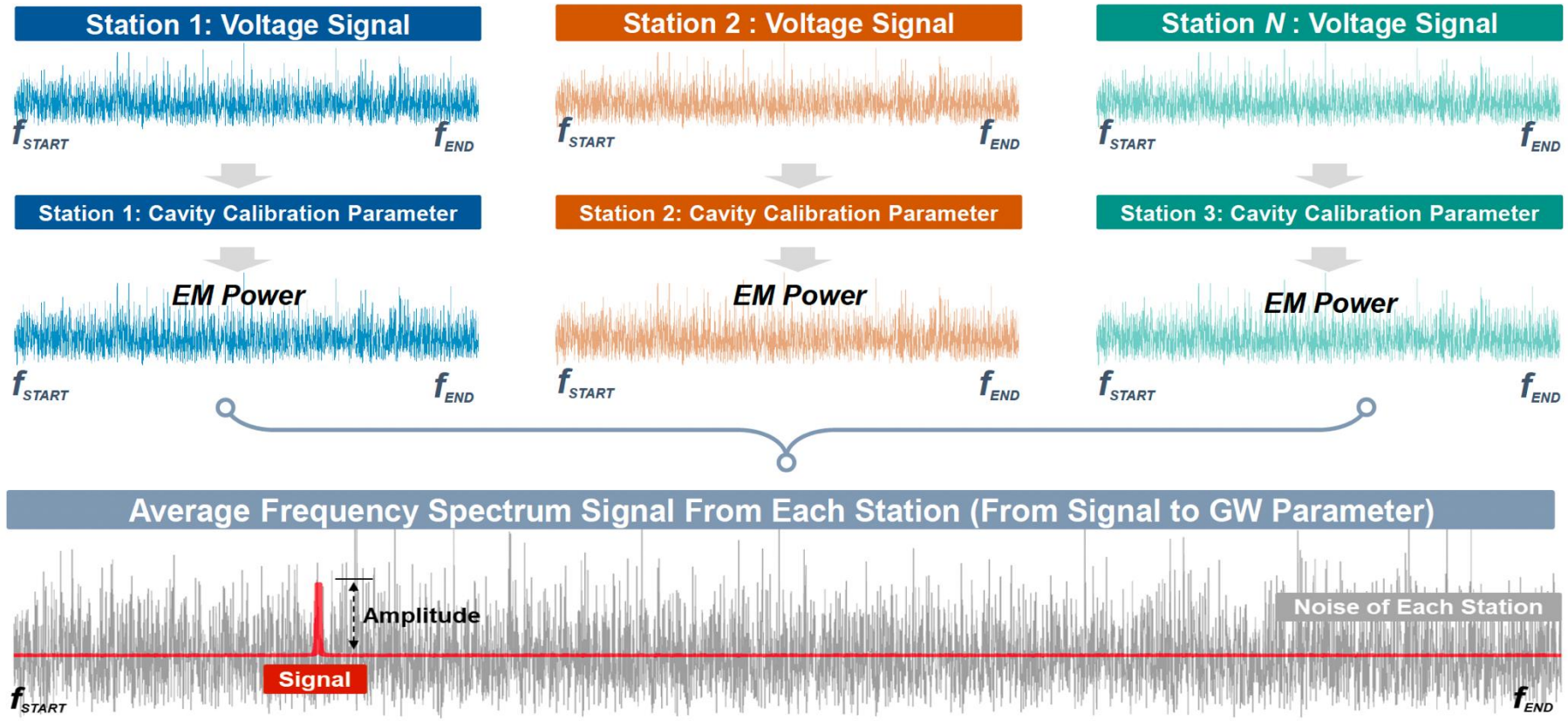
- **Hyperbolic encounters of PBH** — Garcia Bellido & S. Nesseris 1706.02111



Tasks: Have templates ready to use

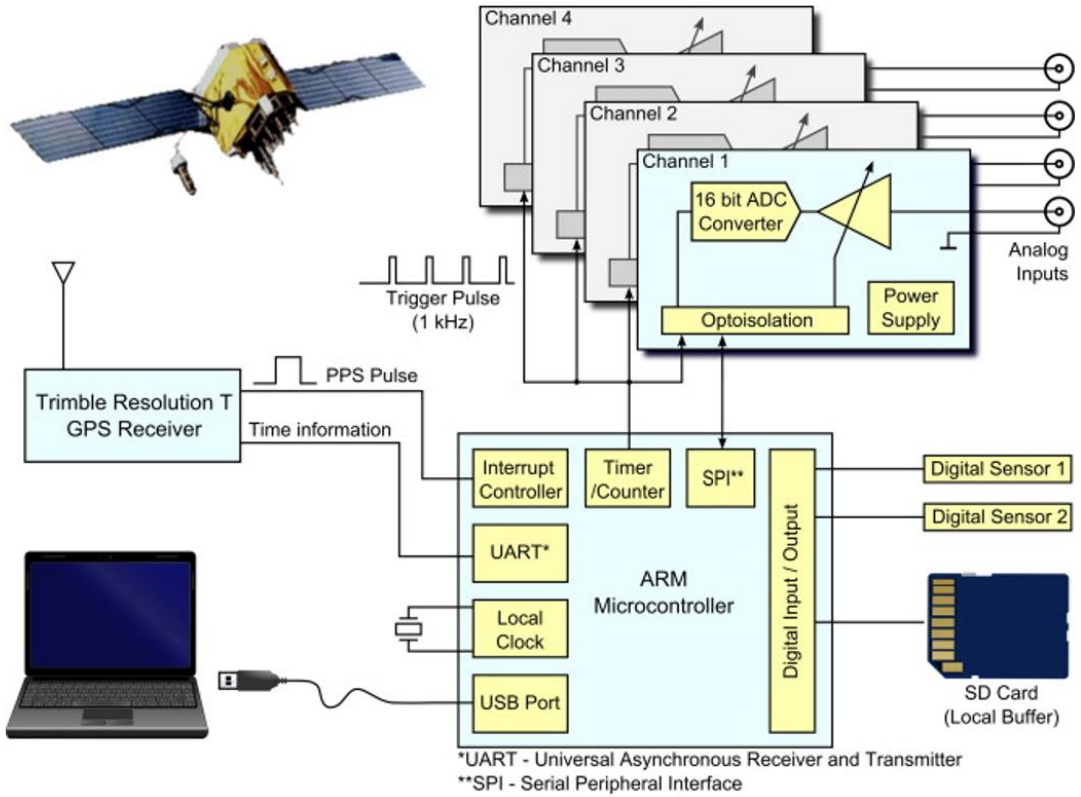
Common Data Taking

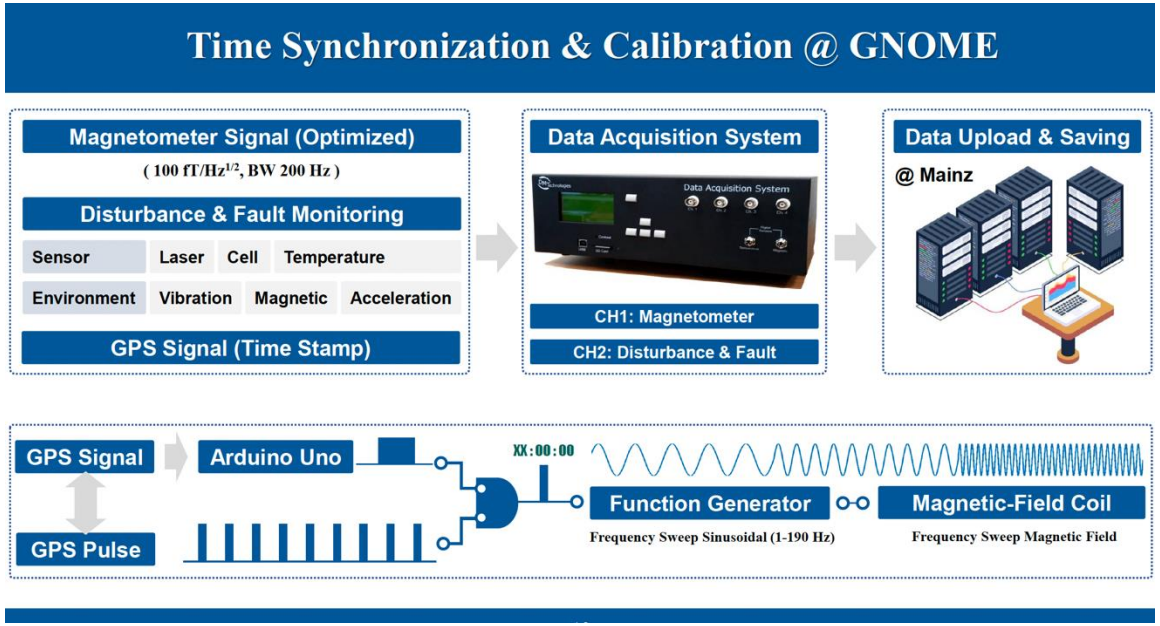
Calibrations (Teng Wu): power, frequency, position/directions, time etc.



Common Data Taking

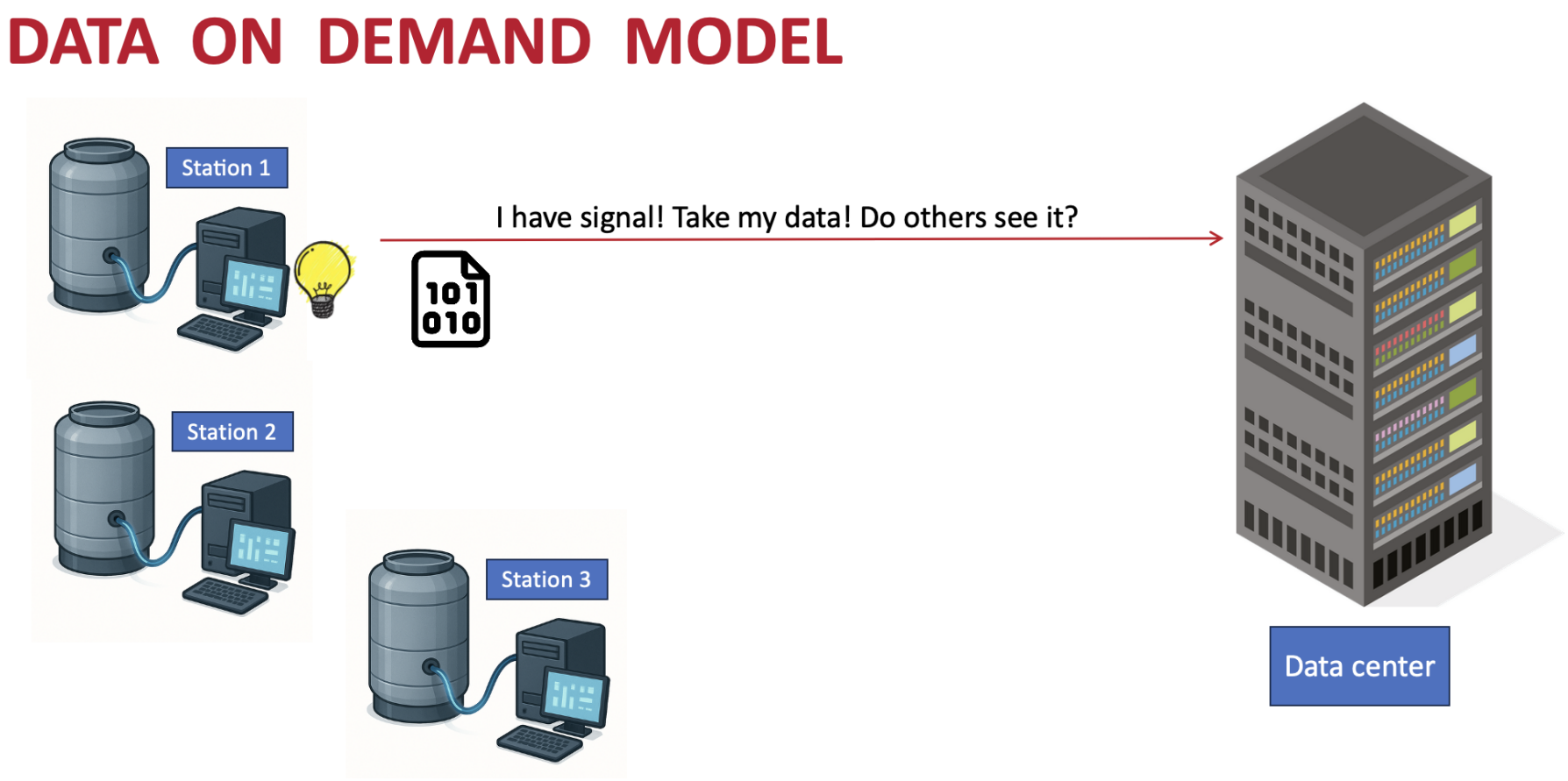
Synchronization (Daniel Gavilán Martín, Oleg Tretiak, Teng Wu): time resolution, timestamp, header and data format





Common Data Taking

Computing Model (Daniel Gavilán Martín, Oleg Tretiak)



Common Data Taking

Data Analysis and Simulations (D. Blas, M. Tobar)

WG4. Data analysis

Tasks:

- Generation of mock data

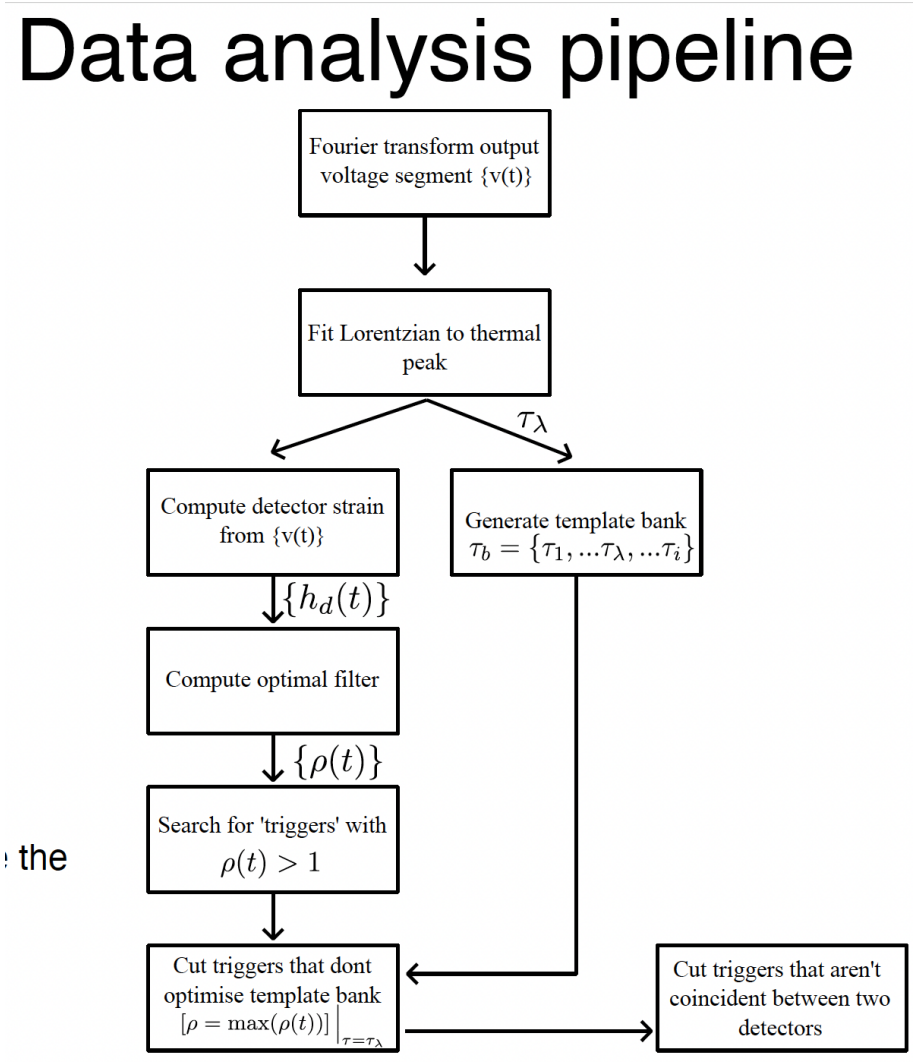
  We need WG1/WG2/WG3 -> baby steps

- Analysis of mock data

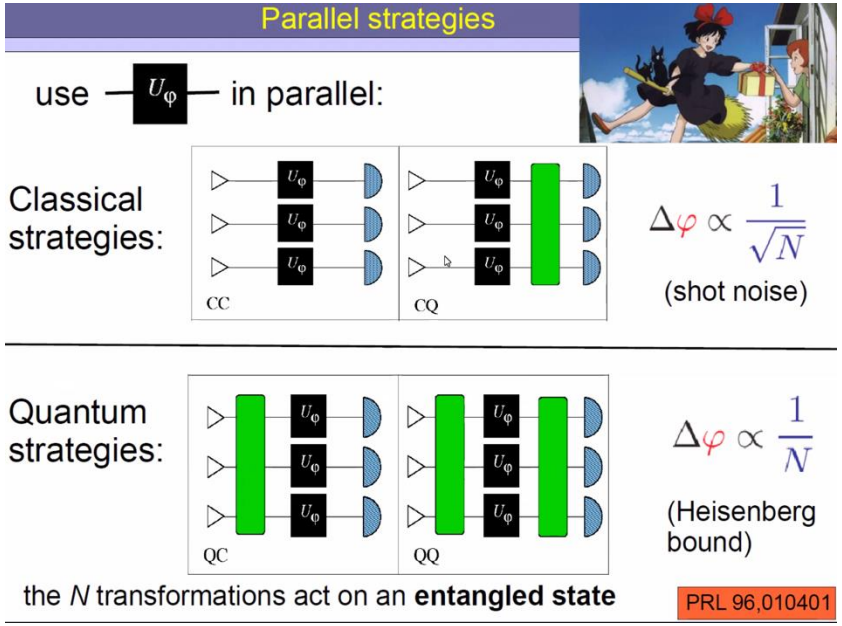
  ML to be exploited

  - SGWBs vs coherent

    Some correlations to exploit?

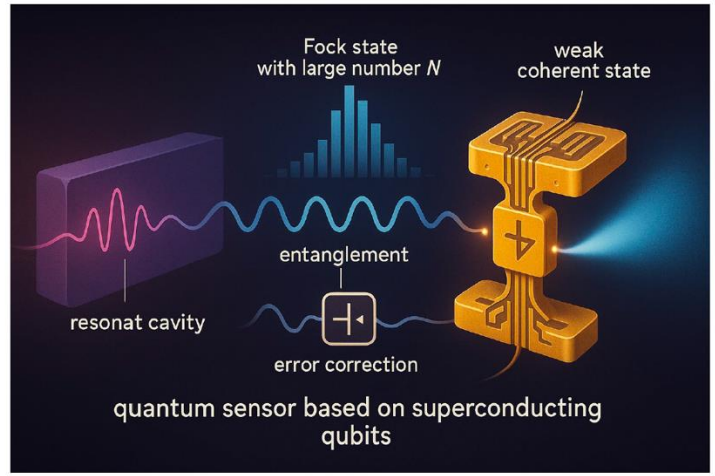


Quantum Sensing (L.Maccone, C.G.)



Towards an optimal detector for HFGW

- An advanced quantum sensor leveraging superconducting qubits that utilizes entanglement, quantum error correction, and high-photon-number Fock states (large N) to significantly boost the sensitivity for detecting weak coherent states.



Maybe in 10 years:

$$\text{Signal} \propto (n_{Fock}+1) \times n_{qubits}^2 \times N_{Detectors}^{(2)} \rightarrow (10+1) \times 100 \times 100 = 10^5$$

Use quantum teleportation to collect signals from different telescopes in the (far) future?