Division 10 future activities

OSB-Division 10

(chairs: Elena Cuoco, Gianluca Guidi, Tania Regimbau, Anuradha Samajdar)

General goal and method

Our goal is to fully prepare for the scientific potential of the Einstein Telescope (ET) by identifying current methodological limitations and developing new analysis approaches. A key part of this effort is building a shared infrastructure in collaboration with the EIB.

Current Status

- Many new methods in development (Blue book, presentations at the ET symposium or annual meetings).

- Mock data challenge for CBC sources (long duration, overlap). One paper on unmodelled long duration searches (Macquet et al.) and work on stochastic and anomaly detection via autoencoder.

- Brainstorming for the next MDCs with more diverse sources (bursts, CW, stochastic, glitches, correlated noise)

Plans for the future

- Engage more contributors in analyzing official MDC data with clear comparison metrics and publication goals.

- Identify individual experts or groups to take the lead for the different search categories (CBC, Burst, CW, SB, PE, etc.).

Plans for the future

Some of the work will focus on:

- High redshift CBC population

- Long duration transients, making it necessary to account for Earth's motion and modulation effects in the analysis

- CW and long-transient (tCW) signals whose key challenges include handling 3G-specific issues like CBC background, signal superposition, and real-time analysis, with a focus on innovative techniques including ML, image processing, and new computing frameworks. Collaboration across Divisions 7 and 10 is essential to tackle these goals.

- Stochastic: cosmological background and correlated noise

Discussion still on-going