

Real-Time Gravitational Wave Data Analysis

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General Relativity predicts that astrophysical systems or events with high mass-energy flux emit gravitational waves, a time varying curvature of space-time which carry energy, and propagate at the speed of light. The spatial strain induced by a passing gravitational wave (GW) is exceedingly small ($\sim 10^{-21}$), making their detection amidst instrumental noise a highly technical challenge. To date, GWs have not been detected directly. The effort to detect GWs has resulted in a global network of GW detectors (LIGO Scientific Collaboration). In collaboration with optical/radio astronomy, confirmation is sought by coincident detection of GWs and associated electromagnetic events. This has motivated the need to improve signal detection efficiency in real time, to enable rapid response targeted electromagnetic searches.

Our research at Sheffield has focused on developing low latency signal processing tools, conceived by Dr Ed Daw

Author: Mr TOMLINSON, Clive (Sheffield University)

Presenter: Mr TOMLINSON, Clive (Sheffield University)

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