

Astrophysics from stochastic background measurements

J.D. Romano
The University of Texas at Brownsville
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LIGO:

- Expect to set upper limits.
- Detect $\Omega_{\text{gw}} \sim 10^{-6}$ with LIGO-I, $\Omega_{\text{gw}} \sim 10^{-9}$ with LIGO-II.
- If detect, study isotropy/anisotropy:
 - If anisotropic, probably galactic and due to exotic sources.
 - If isotropic, not sure if due to cosmological population of astrophysical sources or primordial sources. Need to study $\Omega_{\text{gw}}(f)$.
- $\Omega_{\text{gw}}(f)$ gives info about number density and dE/df .

LISA:

- Expect detections.
- Galactic WD-WD binaries should dominate at low freqs: $\Omega_{\text{gw}} \sim 10^{-11}$.
- Study anisotropy to determine distribution of sources on sky.
- If isotropic, not sure if due to a cosmological population of astrophysical sources or primordial sources.
- Primordial background masked by astrophysical background.

What we need from source analysts:

- $\Omega_{\text{gw}}(f)$ from number density, dE/df , and formation/event rate as function of z .
- Relation between different $\Omega_{\text{gw}}(f)$ and model parameters.
- How do upper limits constrain astrophysical or exotic physics models?

