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Estimating the Hubble constant from the mock GW data of Einstein Telescope

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The Hubble constant is a crucial cosmological parameter that is a measure of the rate of change of the cosmic scale factor per unit cosmic scale factor i.e. a_dot / a. There is a considerable discrepancy between the measurements of the Hubble constant from standard candle observations and those from cosmic microwave background (CMB) observations. Data from gravitational wave (GW) events can provide an independent constraint on the Hubble constant. Higher the number of events, the stronger is the constraint. A tight constraint is expected to be achieved in the era of the third generation detectors such as the Einstein Telescope (ET). Without relying on any electromagnetic observation, one can either use the double black hole (BH) merger or the double neutron star (NS) merger detections to break the mass-redshift degeneracy. We present a method of estimating the Hubble parameter using ET mock data for NS-NS events and discuss the challenges. We assume flat cosmology in our analysis.

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