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Are Induced Gravitational Waves Gauge Dependent?

Primordial black hole formation is always accompanied by a large amount of induced gravitational waves (GWs), in principle observable by future GWs detectors. However, the theoretical expression of the induced GW spectral density is strictly speaking gauge dependent. This gauge dependence thus casts doubts on the theoretical predictions of the induced GWs. In this talk, I will investigate in detail the gauge issue of the induced GWs. I will show that, under reasonable assumptions, the induced GWs is for all practical purposes gauge independent. Thus, free of ambiguities, induced GWs are an excellent source of information about the primordial universe.

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