

## INTISARI

### TENTANG GELOMBANG GRAVITASI PRIMORDIAL

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Telah dilakukan pengkajian gelombang gravitasi yang berasal dari inflasi, atau biasa disebut gelombang gravitasi primordial. Aspek-aspek inflasi yang dijelaskan meliputi kelemahan Teori Ledakan Besar, mekanisme inflasi, dan analisis fluktuasi inflaton. Inflasi dijelaskan melalui mekanisme *slow-roll* dan disebabkan oleh medan skalar yang disebut inflaton. Persamaan gerak inflaton tidak lain adalah persamaan gerak bagi gangguan tensor yang dikaji menggunakan teori gangguan kosmologis. Fluktuasi inflaton membangkitkan gelombang gravitasi yang dapat diamati melalui parameter-parameternya: nisbah tensor-skalar  $r$ , kemiringan spektrum skalar  $n_s$ , dan kerapatan tenaga  $\Omega_{GW}$ .

Kata-kata kunci: *inflasi, gelombang gravitasi primordial.*

## ABSTRACT

### ABOUT PRIMORDIAL GRAVITATIONAL WAVES

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Gravitational waves which comes from inflation, or usually called primordial gravitational waves, has been studied. Aspects of inflation that have been explained are shortcomings of the Big Bang Theory, mechanism of inflation, and fluctuation analysis of inflaton. Inflation is explained through slow-roll mechanism and is caused by scalar field called inflaton. The equation of motion of inflaton is none other than equation of motion of tensor perturbation that is studied using cosmological perturbation theory. Inflaton fluctuation generates primordial gravitational waves that can be observed through its parameters: tensor-to-scalar ratio  $r$ , scalar spectral tilt  $n_s$ , and energy density  $\Omega_{\text{GW}}$ .

Keywords: *inflation, primordial gravitational waves.*