

Direct Wave and Review of gravitational wave data analysis

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Gravitational waves emitted as a binary black hole merges and settles into a stationary state are called ring-down gravitational waves, which provide key clues to exploring the nature of strong gravity. These waves are conventionally modeled by a superposition of damped oscillations known as quasi-normal modes (QNMs). Recently, the potential contribution of a “direct wave” component has been debated, but its mechanism remains largely unknown. We clarify this mechanism through an analysis based on black hole perturbation theory. Furthermore, we review recent studies from gravitational wave data analysis groups.

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