



Contribution ID: 164 Contribution code: S4 High Energy and Particle Physics  
Presentation

Type: Oral

## Spectrum of H-atom in Gravitational Waves from Black Hole Binary

*Friday 24 June 2022 13:15 (15 minutes)*

We investigate the characteristic spectrum of Hydrogen atoms subjected to the gravitational wave (GW) produced by a compact binary inspiral, particularly the supermassive black hole binary (SMBHB). These atoms are assumed to be distributed in the source's local wave zone. The gravitational wave is mathematically described by the quadrupole formula of the linearized theory of General Relativity. The energy shifts and the spectrum of Hydrogen atoms are computed by the first-order perturbation theory in non-relativistic approximation. The effect of GW perturbation is analyzed in a strong-field, a weak-field, and an intermediate-field regime. The extraction of source parameters from the spectrum is also discussed.

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**Session Classification:** S5 Quantum Technology

**Track Classification:** High Energy and Particle Physics