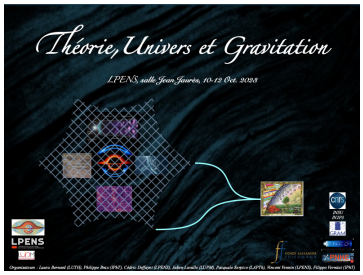

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Dimitrios Kranas (LPENS): Entanglement generation by rotating black holes in thermal baths

mardi 10 octobre 2023 15:55 (20 minutes)

It is well-known that black hole event horizons produce entangled pairs of particles via the Hawking mechanism. D. Page has quantified the entanglement produced by non-rotating black holes in isolation where the input quantum state of fields is the vacuum. In our work, we extend Page's computations in two directions. On the one hand, we include the effect of the rotation of black holes. This results in an additional production process of entangled particles, by the ergoregion. Using tools from gaussian quantum information theory, we investigate the interplay between the horizon and the ergoregion and quantify the entanglement generated by each of the two sources. On the other hand, we study the effect of thermal baths on the generation of entanglement. We find that, depending on the temperature of the thermal bath compared to the Hawking temperature, the entanglement produced by black holes can be significantly suppressed. These results extend previous calculations to the case of rotating black holes immersed in thermal baths and are relevant extensions to discuss additional topics, such as the information loss paradox, in a more realistic framework.

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