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# Entanglement measure for the characterisation of Hawking emission

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Quantum fluctuations on curved spacetimes cause the emission of entangled pairs, as in the Hawking effect from black hole horizons. We use an optical analogue to gravity to investigate the influence of the spacetime curvature on quantum emission. We calculate the mode conversion analytically for all frequencies. Due to dispersion, the spacetime curvature varies as a function of frequency and the radiation is not described by a single temperature. We find that the measurable photon number correlations transition from complex multimode to two-mode when horizons are formed. We use the Logarithmic Negativity to measure the two-mode entanglement and find that its magnitude is enhanced with a characteristic shape in the presence of horizons. The spacetime curvature rules the kinematics and the quantum state that is generated. These are genuine features of optical and non-optical analogue systems.

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