

# The Law of Hyperbolic Variation in the Gamma Function

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## Abstract

We investigate the conservation law of the gamma function in the Gamma Function of Quantum Field Theory (QFT) in the presence of a single field. We derive the conservation law for the gamma function in the QFT of the Schwarzschild and the neutron star black holes in QFT. We also investigate the conservation law for the gamma function in the QFT of the Haldane-Sommerfield black hole and the neutron star black hole in QFT. In the case of QFT, we derive the conservation law for the gamma function in the QFT of the Haldane-Sommerfield black hole and the neutron star black hole. Our results show that the conservation law is not sufficient for the gamma function in the QFT of the neutron star black hole. Furthermore, the conserved energy analysis shows that the conservation law is not going to be the correct one in the QFT of the neutron star black hole. Our results can be viewed as a proof against the conservation law of the gamma function in QFT.