

Measuring the second order correlation function and the coherence time using random phase modulation

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The accuracy and reliability of utilizing Hanbury-Brown-Twiss interferometer to derive the second order correlation function $g(2)$ and the coherence time was investigated. We found that the significance of the high order correction is related to the factor $I\bar{\tau}_c$, which is the overlapping of the photon wave packets. A novel technique was also demonstrated to measure the coherence time τ_c of a light source using the random phase modulation. This method is particularly suitable for a weak light source with a long coherence time.