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【404】Direct field correlation measurement on the electromagnetic ground state

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The ground state of electromagnetic radiation is characterized by the presence of fluctuating zero-point electric fields. A direct method to characterize their spectral composition is still missing. In this work, we present the first direct electric field correlation measurement on the electromagnetic vacuum state at terahertz frequencies. It presents a peak value of 6.20 *10ˆ-2 volts squared per square meter at zero time delay. Its measurement has been performed using a combination of electro-optic detection and ultrashort pulses. The spatial dependence of the field coherence has been investigated, together with the influence of the probed space-time volume on the detection bandwidth. We also provide a model for the quantitative prediction of the experimental result.

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