

Fabrizio Piacentini

INRIM

Strada delle Cacce 91 - 10135 Torino, Italy

f.piacentini@inrim.it

Mode structure reconstruction of an optical field by multi-photon statistics

F. Piacentini, E.A. Goldschmidt, I. Ruo Berchera, S.V. Polyakov, S. Peters,
S. Kuck, G. Brida, I.P. Degiovanni, A. Migdall, M. Genovese

Knowing the number and structure of occupied electromagnetic modes of a multimode light field is of utmost relevance in minimizing losses and decoherence effects in quantum information protocols.

We present a method to reconstruct the underlying mode structure of multi-mode classical and non-classical light fields exploiting multiple-order photon number auto-correlation functions.

The obtained results show successful reconstruction of up to three modes in several different experimental regimes, demonstrating the robustness and versatility of our method.