Quantum imaging: challenges and perspectives in radiometry and biophotonics

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Abstract: Non-classical correlations in optical beams offer unprecedented opportunity of reducing the uncertainty of measurements especially when a low photon flux, down to the single photon level, is used. We review the principles and the state-of-the-art of quantum imaging and sensing techniques with emphasis on the applications to radiometry and biophotonics. In particular, non-classical correlations could represent a cutting-edge tool for investigating phototransduction processes at the fundamental level, such as the one responsible of human vision.