

Spatially entangled Airy photons

Ohad Lib and Yaron Bromberg

Racah Institute of Physics, The Hebrew University of Jerusalem, Jerusalem 91904, Israel

ohad.lib@mail.huji.ac.il

Over the past decade, Airy beams have been the subject of extensive research, leading to new physical insights and various applications. In this work, we extend the concept of Airy beams to the quantum domain. We generate entangled photons in a superposition of two photon Airy states via spontaneous parametric down conversion, pumped by a classical Airy beam. We show that the entangled Airy photons preserve the intriguing properties of classical Airy beams, such as free acceleration and reduced diffraction, while exhibiting nonclassical anti-correlations.