

## **POINT SOURCES AND RAYS IN THE PHASE-SPACE: NOVEL TOOLS FOR OPTICAL FIELD MODELLING**

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Modelling and simulations of optical fields in any state of spatial coherence are restricted because of the complexity of their mathematical representation. The use of novel concepts, in the framework of the phase-space representation of the field (sometimes called Wigner Optics), as the spatial coherence wavelets and the marginal power spectrum allows a better understanding of the phenomena and the developing of efficient algorithms for numerical calculations. Such concepts provide a description of the field as emitted by sets of radiant and virtual point sources, distributed on separate layers that can be brought together on a plane in the ordinary space. Dual point sources appears at the positions where radiant and virtual point sources coincide. Each set of sources determine a ray-map for the propagation of the field between specific planes in space. Any point source and its pencil of rays can be accessed individually, which makes the model very useful for optical design.

Lecture co-financed by the European Union in scope of the European Social Fund