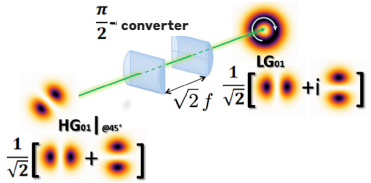
What is the potential of OAM generators on the market?

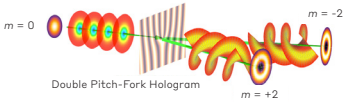
CYLINDRICAL LENS

Two cylindrical lenses convert, by successive phase transformations, from HG modes to LG modes with OAM.



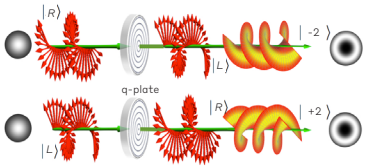
PHASE HOLOGRAM

A printed diffraction grating generates an OAM wave by regular alternation of constructive and destructive interference.



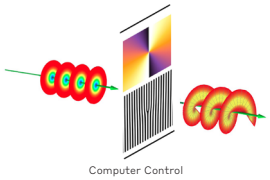
Q-PLATES

This anisotropic material transforms a circularly polarized Gaussian beam into a twisted beam carrying an OAM.



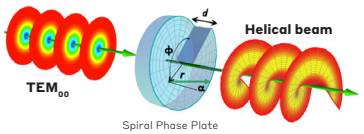
SPATIAL LIGHT MODULATOR

A pixelated matrix composed of liquid crystals, which when programed by a computer behaves as both a plane and a phase hologram to generate an OAM wave.



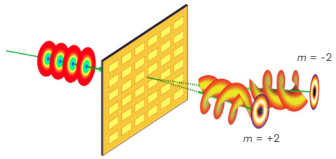
SPIRAL PHASE PLATE

A spiral phase plate creates a vortex beam whose characteristics depend directly on the shape of the plate.



METAMATERIALS

An ultra-thin metamaterial, changes the phase of an incident beam and generates an OAM wave.



MULTI PLANE LIGHT CONVERSION (MPLC)

The Cailabs component generates OAM waves using a succession of reflections on a single textured phase plate and free space propagation.

The technology...	CYLINDRICAL LENS	SPIRAL PHASE PLATE	PHASE HOLOGRAM	METAMATERIALS	SPATIAL LIGHT MODULATOR	Q-PLATES	MULTI PLANE LIGHT CONVERSION (MPLC)
Can it generate high-order modes?	-	-	-	-	+	-	+
Is it passive?	+	+	+	+	-	+	+
Can it handle high power?	+	+	-	-	-	+	+
Can it generate multiple modes simultaneously?	-	-	-	-	+	-	+
Does it enable space division multiplexing?	-	-	-	-	-	-	+

Images source: Thesis by Ebrahim Karimi from the University of Naples "Federico II" - "Generation and manipulation of laser beams carrying orbital angular momentum for classical and quantum information applications"

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