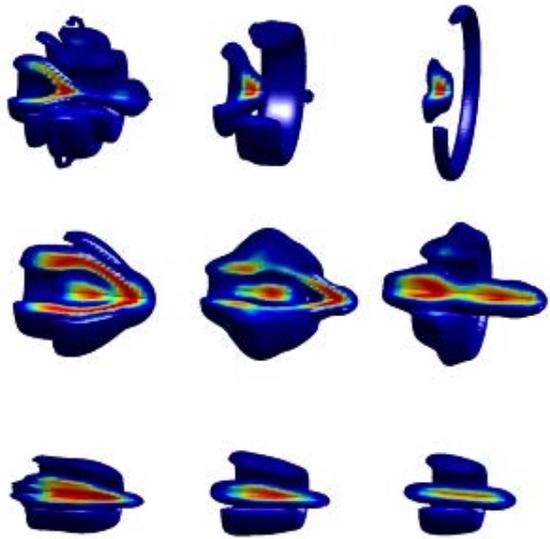


# Nonlinear Ring-Airy light bullets

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[NONLINEAR RING-  
AIRY LIGHT BULLETS]

Controlling the propagation of intense optical wavepackets in transparent media is not a trivial task. During propagation, low- and high-order non-linear effects, including the Kerr effect, multiphoton absorption and ionization, lead to an uncontrolled complex reshaping of the optical wavepacket that involves pulse splitting, refocusing cycles in space and significant variations of the focus. In a recent report [P. Panagiotopoulos, D. G. Papazoglou, A. Couairon, and S. Tzortzakis, "*Sharply autofocused ring-Airy beams transforming into nonlinear intense light bullets*", [Nature Communications 4, 2622 \(2013\)](#)] we demonstrate both numerically and experimentally that intense, abruptly autofocusing beams in the form of accelerating ring-Airy beams are able to reshape into non-linear intense light-bullet wavepackets propagating over extended distances, while their positioning in space is extremely well defined. These unique wavepackets can offer significant advantages in numerous fields such as the generation of high harmonics and attosecond physics or the precise micro-engineering of materials.