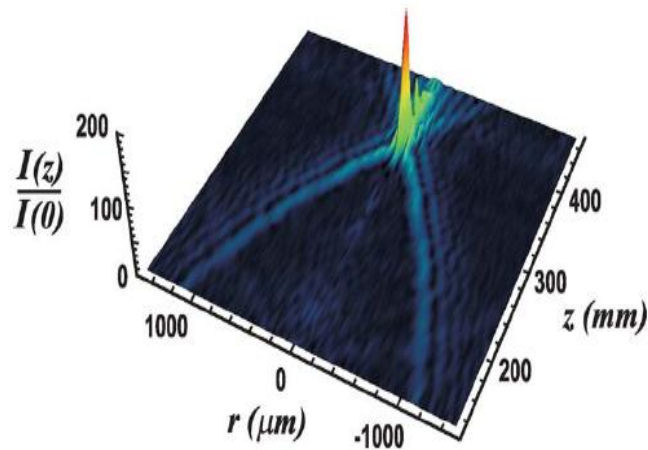


# Sharply Autofocusing Airy Ring Beams

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[ EXPERIMENTAL  
DEMONSTRATION OF  
AUTOFOCUSING AIRY  
RING BEAMS ]

For numerous applications the well localized delivery of laser energy is of crucial character. The main drawback in the usual use of focused Gaussian beams is the gradual increase in the peak intensity while approaching the focus which results to an extended volume energy deposition. In a recent report [D. G. Papazoglou, N. K. Efremidis, D. N. Christodoulides, and S. Tzortzakis, "Observation of abruptly autofocusing waves," [Opt. Lett. 36, 1842-1844 \(2011\)](#)] we demonstrate the experimental realization of abruptly autofocusing waves using a radially symmetric Airy intensity distribution. These waves autofocus, with the intensity maxima following a parabolic trajectory while the intensity contrast achieved is much higher than that of Gaussian beams making these waves exciting candidates for a variety of applications, as in bio-medicine, laser nanosurgery and optical lithography (like in 2-photon photopolymerization).