Multiple soliton compression stages in mid-IR gas-filled hollow-core fibers

The light confinement inside hollow-core (HC) fibers filled with noble gases constitutes an efficient route to study interesting soliton-plasma dynamics [1]. More recently, plasma-induced soliton splitting at the self-compression point was observed in a gas-filled fiber in the near-IR [2]. However, the role of the plasma is so far not investigated in the mid-IR. This range is interesting because the photon energy is much lower, and thereby the plasma formation dynamics will be different, and because the mid-IR is currently being explored for generating few-cycle pulses and for supercontinuum generation. Here we investigate the soliton-plasma dynamics in a mid-IR pumped Xe-filled HC silica fiber based on the so-called anti-resonant (AR) effect. We find a novel soliton dynamics scenario where multiple soliton self-compression stages are observed.

General information
State: Published
Organisations: Department of Photonics Engineering, Fiber Sensors & Supercontinuum, Plasmonics and Metamaterials, Ultrafast Infrared and Terahertz Science
Contributors: Habib, M. S., Markos, C., Bang, O., Bache, M.
Number of pages: 1
Pages: 1-1
Publication date: 2017