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Abstract Submitted  
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**Nonlinear propagation of partially spatially incoherent Airy beams.**<sup>1</sup> YI LIANG, Guangxi Key Laboratory for Relativistic Astrophysics, School of Physics Science and Technology, Guangxi University, Nanning 530004, China, YI HU, DONGHONG SONG, XINZHENG ZHANG, ZHIGANG CHEN, JINGJUN XU, MOE Key Laboratory of Weak-Light Nonlinear Photonics, TEDA Applied Physics Institute and School of Physics, Nankai University, Tianjin 300071, China, — Self-accelerating beams have attracted a lot of attention and inspired a variety of applications in manipulation, biophotonics, and communication etc. In general, most present research on this is focused on the application of coherent beams. However, waves are not necessarily fully phase-coherent. In a recent study, we have theoretically and experimentally generated partially spatially incoherent self-accelerating beams, which still exhibit shape-preserving acceleration as that exhibited by a coherent accelerating beam propagating along the same trajectory. Based on this study, here we report on an experimental study of nonlinear propagation of the partially spatially incoherent Airy beams (PSIABs) in a photorefractive crystal. As we know, a coherent Airy beam initially driven by a self-focusing nonlinearity generally cannot maintain its shape and acceleration in subsequent propagation. Counter to that, in our case, PSIABs could keep their shape better and maintain acceleration even under the action of a self-focusing nonlinearity.

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