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Trajectory and focal length of circular Airy beams in linear index potentials

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## ABSTRACT

In this paper, we investigate the propagation of abruptly autofocusing circular Airy beams (CAB) in linear index potential both analytically and numerically. Based on the initial field located far away from the center, we get the approximate analytical solutions to describe the trajectory and focal length of CAB in linear index potential. The modified focal length formula agrees well with numerical results for a wide range of the initial radius of CAB. Furthermore, the approximate method is also applicable to some dynamic potential varying along the propagation coordinate.

**Keywords:** Autofocusing wave; Circular Airy beam; Linear index potential

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