Generation of dark pulse using fiber laser and mode-locking technique

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Abstract:
Fiber laser gained recognition in various fields of research in recent years. Its ease of realization, compactness

Experimentally it is found that, under appropriate conditions and with a polarizer in the cavity apart from the bright pulse the fiber could emit single or multiple dark pulses. It can be explained based on numerical simulation that the dark pulse generation in the fiber laser is an outcome of the creation of the dark soliton using mode-locking technique.

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I. Introduction

In the modern optical application field, fiber laser bring no-ticeable attention due to its attractive features like convenience, reliability and compactness. Especially pulsed operation of the fiber laser has been explored widely for their benefits and numerous utility in medical science [1], [2], communication [3], [4], sensors [5], [6] and many more application areas. For understanding the pulse development in non-linear systems and to inculcate a stimuli to explore various pulse evolutions by carefully managing the parameters, there is always a claim for fiber laser which is demonstrated [illegible] mode-locking technique by erbium-doped fiber laser dissipative four wave mi[illegible]gg-grating filter. This yields a very interesting result where researcher can start to monitor dark pulse in mode locked laser [7]. Thenceforth, the dark pulses has been analyzed experimentally in different conditions [7]–[10] and gained considerable attention. A CW of dark pulse of 80GHz repeating rate is generated in the normal dispersion regime,. However, in all