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## Controllable stretched pulse and dissipative soliton emission using non-linear polarisation rotation and cavity loss tuning mechanism

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**Abstract:** The authors demonstrate a controllable generation of a stretched pulse and dissipative soliton in a normal dispersion erbium-doped fibre laser (EDFL) based on non-linear polarisation rotation technique. It is found that the mode-locking could self-start in the EDFL even without inserting a polariser in the cavity because of the large residual polarisation-dependent loss of a cavity component. By slightly adjusting a polarisation controller, a stretched pulse can be switchable to the dissipative soliton, while maintaining the repetition rate of 2.5 MHz. The stretched pulse has a pulse width of 0.35 ps with energy of 127.6 pJ, whereas the dissipative soliton has a pulse width of 0.60 ps with energy of 208.4 pJ.


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