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Q-switched pulse generation in L-band region with polyacrylonitrile saturable absorber

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Abstract In this study, we assess the practicality of using Polyacrylonitrile (PAN) as a saturable absorber (SA) for generating Q-switched pulses within an erbium-doped fibre laser (EDFL) cavity. A successful combination of PAN, a resin material, and polyvinyl alcohol resulted in the formation of a SA film. This film was utilised to generate stable Q-switched pulses operating in a long-wavelength band of 1572 nm. The greatest repetition rate achieved was 66.1 kHz, while the minimum pulse width was 2.43 μ s. The maximum pulse energy was achieved at 52 nJ and measured at a pump power of 175.9 mW. To the best of our knowledge, this study is the first report of EDFL passive Q-switching employing a PAN absorber.

Keywords **Author Keywords:** polyacrylonitrile; Q-switched laser; L-band; EDFL; thin film
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