Formation of Random Dark Envelope Solitons from Incoherent Waves

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Abstract:
This letter reports experimental results on random temporal dark solitons. One excites an incoherent large-amplitude propagating spin-wave packet in a ferromagnetic film strip with a repulsive, instantaneous nonlinearity. One then observes the random formation of dark solitons from this wave packet. The solitons appear randomly in time and in position relative to the entire wave packet. They can be gray or black. For wide and/or very strong spin-wave packets, one also observes multiple dark solitons. In spite of the randomness of the initial wave packets and the random formation processes, the solitons show signatures that are found for conventional coherent dark solitons.

References: