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Three-dimensional spatiotemporal pulse-train solitons

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Abstract

Solitons are self-trapped wavepackets for which linear broadening is robustly balanced by nonlinear self-focusing effects and exhibit particle-like properties. Solitons that are self-trapped in one or two dimensions have been observed in many systems, including: shallow and deep water waves, nervous system, meteorology, Bose-Einstein condensates and optics. Experimental demonstration of three-dimensional spatiotemporal solitons, on the other hand, is still considered a grand challenge in nonlinear science.

In this seminar, I will present experimental observation of three-dimensional spatiotemporal solitons. A spatially-bright temporally-dark pulse-train beam is trapped in a homogeneous medium that supports two types of nonlinearities: slowly responding saturable self-focusing that self-trap the beam transversely (spatially) and fast self-phase modulation that self-localizes the dark notches longitudinally (temporally). This work opens the possibility for experimental investigations of various solitons phenomena in three-dimensions.

ההרצאה תתקיים ביום רביעי 14.6.17 בשעה 12:30

בבניין פיסיקה (לידוב), קומה חמישית, אשר פרס 502

The lecture will take place on Wednesday, 14.6.17 at 12:30

at the Physics Building (Lidow), 5th floor, Asher Peres 502

Ph.D. Student of Associate Professor Oren Cohen