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Nonlinear wave-packet dynamics in a disordered medium GEORG SCHWIETE, Texas A&M University, ALEXANDER FINKEL'STEIN, Texas A&M University and The Weizmann Institute of Science — We develop an effective theory of pulse propagation in a nonlinear and disordered medium. The theory is formulated in terms of a nonlinear diffusion equation. Despite its apparent simplicity this equation describes novel phenomena which we refer to as "locked explosion" and "diffusive" collapse. The equation can be applied to such distinct physical systems as laser beams propagating in disordered photonic crystals or Bose-Einstein condensates expanding in a disordered environment.

Georg Schwiete
Texas A&M University

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