1100-35-54 **Nils Ackermann***, nils@ackermath.info, and **Andrzej Szulkin**. *A concentration phenomenon for elliptic equations with indefinite nonlinearities.*

For a domain $\Omega \subset \mathbb{R}^N$ we consider the equation

$$-\Delta u + V(x)u = Q_n(x)|u|^{p-2}u$$

with zero Dirichlet boundary conditions and $p \in (2, 2^*)$. Here $V \geq 0$, and the Q_n are bounded functions that are positive in a region contained in Ω and negative outside, and such that the sets $\{Q_n > 0\}$ shrink to a point $x_0 \in \Omega$ as $n \to \infty$. We show that if u_n is a nontrivial solution corresponding to Q_n, then the sequence (u_n) concentrates at x_0 with respect to the H^1 and certain L^q-norms.

This equation serves as the model for a linearly polarized wave propagating in a waveguide composed of two optical materials: a self-focusing core and a defocusing cladding. Our result says that as we reduce the diameter of the core, the light intensity and energy concentrates at the core. (Received January 25, 2014)