## Problem with critical Sobolev exponent and with weight

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Let  $\Omega$  be a bounded domain in  $\mathbb{R}^n$  with  $n \geq 3$ . We are concerned with the problem of existence of a function u satisfying the nonlinear elliptic equation:

$$\left\{ \begin{array}{rl} -div(p(x)\nabla u)=u^{q-1}+\lambda u & \mbox{in }\Omega,\\ u>0 & \mbox{in }\Omega,\\ u=0 & \mbox{on }\partial\Omega, \end{array} \right.$$

where  $p: \overline{\Omega} \longrightarrow \mathbb{R}$  is a given positive weight such that  $p \in H^1(\Omega) \cap C(\overline{\Omega}), q = \frac{n+2}{n-2}$ is the critical exponent for the Sobolev embedding  $H^1_0(\Omega) \subset L^q(\Omega)$  and  $\lambda$  is a real constant.

These results are obtained in collaboration with R. Hadiji.