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Qi Han* (qhan@wpi.edu), Department of Mathematical Sciences, Worcester Polytechnic Institute, Worcester, MA 01609. *When does the Elastic Torsion Problem*

$$-\Delta u = 1$$

have a solution in R^N ? Preliminary report.

In this talk, we discuss the solvability of the equation

$$-\Delta u + \mu u^q = 1 \text{ in } R^N$$

when $N \geq 2$, which is the extension of the classical Elastic Torsion Problem

$$-\Delta u = 1$$

with zero Dirichlet data to the whole space.

Here, μ denotes a general Radon measure, and the general Sobolev space $M^{q,p}(R^N)$ and its fine properties are described. (Received September 06, 2015)