1061-35-190 **Antonio Capella*** (capella@matem.unam.mx). *Solutions of a pure critical exponent problem involving the half-laplacian in annular-shaped domains.*

We consider the nonlinear and nonlocal problem

$$A_{1/2}u = |u|^{2^\sharp - 2}u \quad \text{in}\,\Omega, \qquad u = 0 \quad \text{on}\,\partial\Omega$$

where $A_{1/2}$ represents the square root of the Laplacian in a bounded domain with zero Dirichlet boundary conditions, $\Omega \subset \mathbb{R}^n$, $n \geq 2$ and $2^\sharp = 2n/(n-1)$ is the critical trace-Sobolev exponent. We assume that Ω is annular-shaped (i.e. $\exists R_2 > R_1 > 0$ s.t. $\{x \in \mathbb{R}^n\,\text{s.t.}\,R_1 < |x| < R_2\}$, $0 \notin \Omega$, and invariant under a group Γ of orthogonal transformations of $\mathbb{R}^n$. We show that: if R_1/R_2 is arbitrary and the minimal Γ-orbit of Ω is large enough, or if R_1/R_2 is small enough and Γ is arbitrary, then the above problem has a positive solution and multiple sign changing solutions.

The results presented here are similar to the ones of Clapp and Pacella [in Math. Z. 2008] for the analogous problem in the case of the Laplacian and the critical Sobolev exponent. (Received April 13, 2010)