1. Abstract

Let $\Omega$ be a bounded domain in $\mathbb{R}^N$, with smooth boundary $\partial \Omega$. A model of nonlinear elliptic boundary value problem is the classical Lane-Emden-Fowler equation,

$$
\begin{aligned}
\Delta u + u^p &= 0 \quad \text{in } \Omega \\
u &> 0 \quad \text{in } \Omega \\
u &= 0 \quad \text{on } \partial \Omega
\end{aligned}
$$

where $p > 1$. We are interested in finding solutions to this problem which are smooth in $\Omega$ and equal to 0 almost everywhere on $\partial \Omega$ with respect to surface measure. More precisely, we want to study solutions to problem (1.1) that satisfy the boundary condition in a suitable trace sense, while not necessarily in a continuous fashion.