

Marcelo de Almeida (Aracajú, Brazil).

On the heat equation in half-space with nonlinearity and singular anisotropic potential on the boundary

This paper concerns with the heat equation in the half-space \mathbb{R}_+^n with nonlinearity and singular potential on the boundary $\partial\mathbb{R}_+^n$. We develop a well-posedness theory (without using Kato and Hardy inequalities) that allows us to consider critical potentials with infinite many singularities and anisotropy. Motivated by potential profiles of interest, the analysis is performed in weak L^p -spaces in which we prove key linear estimates for some boundary operators arising from the Duhamel integral formulation in \mathbb{R}_+^n . Moreover, we investigate qualitative properties of solutions like self-similarity, positivity and symmetry around the axis $\overrightarrow{Ox_n}$.