1159-35-23 **Gisèle Ruiz Goldstein*** (ggoldste@memphis.edu), Department of Mathematical Sciences, University of Memphis, Memphis, TN 38152, **Jerome A Goldstein** (jgoldste@memphis.edu), Department of Mathematical Sciences, University of Memphis, Memphis, TN 38152, **Ismail Kömbe** (ikombe@ticaret.edu.tr), Department of Mathematics, Faculty of Humanities and Social Sciences, Istanbul Commerce University, Beyoglu, Istanbul, Turkey, and **Reyhan Tellioglu** (reyhan.tellioglu@istanbulticaret.edu.tr), Department of Mathematics, Faculty of Humanities and Social Sciences, Istanbul Commerce University, Beyoglu, Istanbul, Turkey.
Nonlinear Parabolic Equations with Robin Boundary Conditions and Hardy-Leray Type Inequalities.

Of concern is the absence of positive solutions in the sense of distributions of the mixed problem

$$\frac{\partial u}{\partial t} = \Delta(u^m) + V(x)u^m + \lambda u^q, \quad \text{on} \;\; \Omega \times (0,T),$$
$$u(x,0) = u_0(x) \geq 0 \quad \text{in} \;\; \Omega,$$
$$\frac{\partial u}{\partial \nu} = \beta(x)u \quad \text{on} \quad \partial\Omega \times (0,T),$$

for $x \in \Omega \subset \mathbb{R}^N$ and $t \geq 0$. Here $0 < m < 1$, so the equation includes *fast diffusion,* and $q > 0$ so there is a Fujita type term. In the case where $m = 1, \lambda = 0$, the Dirichlet boundary condition replaces the Robin one, $0 \in \Omega$ and $V(x)$ is the inverse square potential, then this result reduces to the 1984 Baras-Goldstein nonexistence result. (More general conditions will be discussed in the talk.) When $0 < m < 1$ and $\lambda = 0$, this extends the nonexistence result of Goldstein-Kombe (2003). The complicated analysis involves new refinements of Hardy's inequality with new hidden energy terms. (Received July 04, 2020)