ON THE CAUCHY PROBLEM ASSOCIATED TO THE BRINKMAN FLOW IN $\mathbb{R}^n_+$

Eduardo Arbieto Alarcon [1], **Rafael José Iorio Junior**[2], **Michel Molina del Sol**

[1] **Universidade Federal de Goiás - IME, GO Brasil**

[2] **Institute of Pure and Applied Mathematics (IMPA) RJ Brasil**

[3] **Universidad Católica del Norte - Facultad De Ciencias - Antofagasta Chile**

Resumo/Abstract:

In this article we will discuss the local and global well posedness of the Brinkman equations, that model fluid flows, in certain types of porous media, namely

$$\begin{aligned} \partial_t \rho + div\left(\rho v\right) &= F\left(t,\rho\right), \\ \left(1-\Delta\right) v &= -\nabla P\left(\rho\right), \\ \left(\rho\left(0\right), v\left(0\right)\right) &= \left(\rho_0, v_0\right), \end{aligned} \tag{1}$$

$$\rho = \rho\left(t,x,y,z\right), v = v\left(t,x,y,z\right), \tag{2}$$

this time in the upper half space

$$\mathbb{R}^3_+ = \left\{\left(x,y,z\right) \in \mathbb{R}^3 \,|x,y \in \mathbb{R},\ z \geqslant 0\right\}. \tag{3}$$

Here ρ is the fluid's density, v its velocity, P is the pressure, F is an external mass flow rate. Moreover, we will introduce appropriate boundary conditions, involving the flow of the fluid on the plane

$$\Pi = \left\{\left(x,y,z\right) \in \mathbb{R}^3 \,|z = 0\right\}, \tag{4}$$

which are required by the physics of the problem, see [1] and [2].

Referências Bibliográficas

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[2] **E. A. Alarcon, R. J. Iorio, Jr. and M. Molina del Sol, *On the Cauchy Problem Associated to the Brinkman Flow in* $\mathbb{R}^n$, Appl. Anl. Discrete Math., 6 (2012), 214-237.**