"ON SOME HYPERBOLIC-PARABOLIC EQUATIONS WITH NONLINEARITY OF KIRCHHOFF-CARRIER TYPE IN WITH DOMAINS MOVING BOUNDARY IN TWO-DIMENSIONAL".

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Abstract

In this talk we aim to present some recent results for the nonlinear degenerate problem with nonlinearity of Kirchhoff-Carrier type in domains with moving boundary in two dimensional, about existence and uniqueness of local and global regular solutions, and asmyptotic behaviour for the following problem:

$$(H-P)\begin{cases} (\rho_1(t)u_t)_t + \rho_2(t)u_t - (1 + M(t, \int_{\alpha(t)}^{\beta(t)} u_x(x,t)dx))u_{xx} = f(x,t) \text{ in } Q_t, \\ u = 0 \text{ on } \Sigma_t, \\ u(x,0) = u_0(x), u_t(x,0) = u_1(x), x \in \Omega_0 = (\alpha(0), \beta(0)), \end{cases}$$

where the noncylindrical domain Q_t of R^2 defined by

$$Q_t = \left\{(x,t) \in R^2 : x \in \Omega_t,\ 0 < t < T\right\},$$

$\Omega_t = (\alpha(t),\beta(t))$ and $\Omega_0 = (\alpha(0), \beta(0))$ the intervals for $0 < t < T$, respectively, also, $\alpha(t)$ and $\beta(t)$ are two functions satisfying some appropriate conditions Here $\Sigma_t = \bigcup_{0<t<T} (\alpha(t) \times \{t\}) \cup (\beta(t) \times \{t\})$ is the Lateral boundary of Q_t. $M \in C^1([0,\infty) \times [0,\infty))$ is a postive function and $\rho_1(t) \geq 0$ a.e in $(0,T)$, $\rho_2(t) \geq \delta_0 > 0$ a.e in $(0,T)$, $f \in L^2(0,T; H_0^1(\Omega_t))$. The existence of local and global regular solutions we use of Galerkin's method and other methods. To prove the uniqueness apply energy method as in J. L. Lions. Finally, we anayze the asmyptotic behaviour of the solutions, to problem (H-P) making use of method introduced by M. Nakao.