5007-93-473 **Ulcilea Alves Severino Leal***, ulcilea.leal@ufms.br, and **Geraldo Nunes Silva** and **Weldon Alexander Lodwick**. *Optimal Control Under Interval Uncertainty.* Preliminary report.

The purpose of this work is the study of optimal control problem under interval uncertainty. We consider a particular class of the optimal control problem, the linear quadratic problem. This problem has the following form:

$$(P) \qquad \begin{cases} \max_{u\in\Omega} J[u] = \frac{1}{2}\int_0^1 \left[x^T(t)\mathbf{Q}x(t) + u^T(t)\mathbf{R}u(t)\right] dt \\ \text{subject to:} \\ x'(u;t) = \mathbf{A}_{n\times n}x(t) + \mathbf{B}_{n\times m}u(t) \\ x(u,0) = \mathbf{x}_0, \end{cases}$$

where $u : [0,1] \to I\mathbb{R}^m$ is the control, $x : [0,1] \to I\mathbb{R}^n$ is the state of the system, the set Ω is the set of control associated with the problem under consideration, $\mathbf{Q}, \mathbf{R}, \mathbf{A}$ and $\mathbf{B}$ are interval matrix and $\mathbf{x}_0$ interval initial condition.

In this work is shown the problem (P) can be transformed into an equivalent problem. For this purpose it is needed a generalization of the maximum principle for the interval case of linear quadratic problem or transformed this problem in a classic Pareto problem. (Received May 14, 2013)