

On some Properties of Paramonotone Operators

Alfredo N. Iusem

IMPA, Estrada Dona Castorina 110, Jardim Botânico, Rio de Janeiro, RJ, CEP 22460-320, Brazil, iusp@impa.br



Abstract: An operator $T: \mathbb{R}^n \rightarrow \mathbb{R}^n$ is paramonotone iff it is monotone and $\langle T(x) - T(y), x - y \rangle = 0$ implies $T(x) = T(y)$. This definition can be extended to operators defined in a convex set whose values are subsets of \mathbb{R}^n . The notion of paramonotonicity is required to ensure convergence of several interior point methods for variational inequalities. In this paper we establish several properties of paramonotone operators. In particular, we give sufficient conditions for paramonotonicity in the differentiable case. We prove that if the symmetric part of the Jacobian matrix is positive semidefinite and its rank is greater than or equal to the rank of the Jacobian matrix at all points then the operator is paramonotone.

Keywords: variational inequalities, monotone operators, convex programming

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