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Gregorio Malajovich* (gregorio@ufrj.br), C.P. 68530, Rio de Janeiro, RJ 21945-970, Brazil,
and **Carlos Beltrán, Jean-Pierre Dedieu** and **Mike Shub**. *Convexity and the Condition
Number*.

The condition number of a numerical problem is the norm of the derivative of the solution with respect to the coefficients. It is one of the main complexity invariants in numerical analysis. High condition numbers are an obstruction to the stability of algorithms.

One of the main (meta)-theorems in numerical analysis states that the condition number is the reciprocal to the distance to the locus (variety) of degenerate problems. In the case of linear equation solving, the degenerate locus is the set (variety) of matrices with vanishing determinant.

We showed in that case that the condition number is a geodesically convex function, for a certain (particular) Riemannian metric. As a consequence, the maximum of the condition number is attained at the endpoints of such a geodesic. (Received February 19, 2008)