

ON THE RANGE OF THE DERIVATIVE OF GATEAUX SMOOTH MAPPINGS BETWEEN BANACH SPACES AND APPLICATIONS

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ABSTRACT. We present recent advances about the study of the range of a smooth function f defined on a Banach space X or a smooth mapping f between two Banach spaces X and Y . The results depend on the geometry of the Banach spaces X and Y (X finite or infinite dimensional, X^* separable, Y one-dimensional), on the global geometry of the function f (f bounded below, coercive), and on the notion of smoothness (Frechet-smoothness, Gateaux-smoothness). Applications on existence and uniqueness problems of Hamilton-Jacobi equations will be presented.