

THE LIMITING CASE FOR STRONGLY INDEFINITE FUNCTIONALS

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(Submitted by J. Mawhin)

Dedicated to the memory of Karol Borsuk

0. Introduction

After the pioneering work of Pucci and Serrin [4], motivated by the forced pendulum equation, many papers were devoted to the limiting case in critical point theory. Let us recall that, in the limiting case,

$$\sup_Y \varphi = \inf_F \varphi$$

where F and Y link. Some very general results are contained in the paper of Ghoussoub ([3]). For strongly indefinite functionals, the only results we know are due to Silva ([6]). However the geometrical assumptions of Silva are more restrictive than the usual ones. In the present paper, we consider the limiting case for strongly indefinite functionals under the usual assumptions of the saddle-point theorem and the generalized mountain pass theorem. The basic tools are the limit relative category defined by Fournier, Lupo, Ramos and Willem [1] and the quantitative deformation lemma proved in [7].

¹Research supported in part by NSREC-Canada.