

NONLINEAR EIGENVALUES
AND MOUNTAIN PASS
METHODS

M. SCHECHTER – K. TINTAREV¹

(Submitted by Ky Fan)

Dedicated to the memory of Karol Borsuk

1. Introduction

Mountain pass methods have proved very helpful in many applications. In the original formulation, Ambrosetti-Rabinowitz [1] considered a C^1 functional $G(u)$ defined on the whole of a Banach space B . It was assumed that there were elements $e_0, e_1 \in B$ such that

$$(1.1) \quad \max G(e_i) < c := \inf_{\varphi \in \Phi} \max_{0 \leq s \leq 1} G(\varphi(s))$$

where Φ is the set of all continuous maps φ of $[0, 1]$ into B such that $\varphi(i) = e_i$, $i = 0, 1$. It was desired to find a point $u \in B$ such that

$$(1.2) \quad G'(u) = 0, \quad u \neq e_i, i = 0, 1.$$

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