

# Preface

This monograph consists of a series of lectures given partly at the Morningside Center of Mathematics of Chinese Academy of Sciences and the Department of Mathematics of Rutgers University, and entirely at the Department of Mathematics of the University of Franche-Comté in a course of nonlinear analysis in March and April of 2006. The material was mainly taken from some joint work with Thomas Bartsch done while the author as an Alexander von Humboldt fellow visited Giessen University. It presents some results concerning methods in critical point theory oriented towards differential equations which are variational in nature with strongly indefinite Lagrangian functionals. The author thanks greatly T. Bartsch for his kindnesses to him. He would like also to thank H. Brézis for his encouragements and F. H. Lin, Y. Y. Li for the discussions on mathematics of common interest. He also thanks L. Jeanjean for his invitation to come to Besancon and for his suggestions on the content. Finally he thanks the University of Franche-Comté for its optional support.

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