The logarithmic penalty for optimal control problems

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We discuss in this talk numerical methods for optimal control problems, based on logarithmic penalty of constraints. Some preliminary results on well posedness, convergence and estimates of distance to the bondary were obtained in [1]. More recently, we have started in [2] a more accurate analysis of the expansion of the optimal state, costate and control when a logarithmic penalty is used, assuming only specific control constraints. We will discuss their results and their use within numerical codes based on Runge-Kutta discretization schemes.

1) J.F. Bonnans and Th. Guilbaud: *Using Logarithmic Penalties in the Shooting Algorithm for Optimal Control Problems.* Optimal Control, Applications and Methods 24(2003), 257-278.

2) J.F. Bonnans and F. Alvarez and J. Laurent-Varin. Working paper.