Non-degenerate maximum principle for optimal control problems with discontinuous right-hand side

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Abstract: In the paper, optimal control problems with discontinuous right-hand side are considered. The main attention is paid to situations when there are intervals where optimal trajectory lies on a switching surface. It is shown that for such a situation the known optimality conditions degenerate: they are satisfied for any feasible control. Hence such conditions are not informative. New non-degenerate necessary optimality conditions in a form of Maximum principle are formulated

and proved. Comparison of the obtained optimality conditions with ones known from the literature is presented.