

Singular arcs in optimal periodic control problems with scalar dynamics and integral input constraint

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ABSTRACT

We revisit recent results about optimal periodic control for scalar dynamics with input integral constraint [1], under lack of convexity and concavity. We show that in this more general framework, the optimal solutions are bang-singular-bang and generalize the bang-bang solutions for the convex case and purely singular for the concave one. We introduce a non-local "slope condition" to characterize the singular arcs. The results are illustrated on a class of bio-processes models.

This is a joint work with *Thomas Guilmeau* from *University Paris-Saclay* and *Inria*.

References

- [1] T. Bayen, A. Rapaport, F.Z. Tani.: *Optimal periodic control for scalar dynamics under integral constraint on the input*, Mathematical Control and Related Fields Vol. 10 (3), pp. 547–571, 2020.