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**Geometric Conditions for Regularity in a Time-Minimum Problem
with Constant Dynamics**

Continuing earlier research [“Neighbourhood retractions of nonconvex sets in a Hilbert space via sublinear functionals”, J. Convex Analysis 18 (2011) 1–36] on local well-posedness of a time-minimum problem associated to a closed target set $C \subset H$ (H is a Hilbert space) and a convex constant dynamics $F \subset H$ we study the Lipschitz (or, in general, Hölder) regularity of the (unique) point $\pi_C^F(x)$ in C achieved from x for a minimal time. As a consequence, smoothness of the value function is proved, and an explicit formula for its derivative is given.

Keywords: Time-minimum problem, Hölder continuity, proximal, Fréchet subdifferential, Clarke subdifferential, duality mapping, curvature, proximal smoothness.

MSC: 49J52, 49N15