

Erratum: "On viscosity solutions of certain Hamilton-Jacobi equations: Regularity results and generalized Sard's Theorems"

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Theorem 1 stated in [1] is not correct, the correct version is as follows:

Theorem 1. *Assume that (H1), (H2) and (H3) are satisfied, let $u : M \rightarrow \mathbb{R}$ be a viscosity solution of (1). Then the function u is locally semiconcave on M and u is $C_{loc}^{1,1}$ on the open set $M \setminus \overline{\Sigma(u)}$.*

The statement of Theorem 1 in [1] claims that the set $\Sigma(u)$ is nowhere dense in M or in other words that its closure has empty interior ; as shown by Mario Santilli in [2] this result is false. The problem in the proof given in [1] is on pages 22-23 of the preprint version where the regularity properties of the front implicitly assume indeed that the limiting subdifferential is continuous rather than upper semicontinuous. We refer to the paper by Mario Santilli [2] for examples of distance functions with dense singular sets.

References

- [1] L. Rifford. On viscosity solutions of certain Hamilton-Jacobi equations: regularity results and generalized Sard's theorems. *Comm. Partial Differential Equations*, 33(1-3):517–559, 2008.
- [2] M. Santilli. Distance functions with dense singular sets. *Comm. Partial Differential Equations*, 46(7):1319–1325, 2021.

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