

Rademacher's theorem in metric spaces: the theorems of Cheeger and Bate

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We investigate two different ways to generalize Rademacher's theorem to metric measure spaces that provide different descriptions of the same fact. This gives two characterizations of Lipschitz differentiability spaces, one in terms of curve fragments ("Alberti representations") and the other one in terms of the "Lip-lip" condition. This last condition is strictly related to a theorem of Cheeger, which provides a sufficient condition for a metric measure space to be a Lipschitz differentiability space.

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