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**David Bate\***, bate@math.uchicago.edu, and **Sean Li**. *The geometry of Radon-Nikodym Lipschitz differentiability spaces I.*

We give a purely geometric characterisation of those metric measure spaces that satisfy the differentiability theory of Cheeger for Lipschitz functions taking value in Banach spaces with the Radon-Nikodym property. This characterisation is centred on a notion of connecting points in the metric space by certain Lipschitz curves that form partial derivatives of any Lipschitz function at almost every point. This allows us to form the total Cheeger derivative from partial derivatives analogously to the Euclidean case. (Received January 25, 2016)