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Universal branch statistics of branched flows JAKOB METZGER, RAGNAR FLEISCHMANN, THEO GEISEL, Max-Planck-Institute for Dynamics and Self-Organization, 37073 Goettingen, Germany — Branched flow is a universal phenomenon of particle and wave flows which are subjected to weak, correlated disorder. It has been observed on length scales ranging from a few micrometres, affecting the transport properties of semiconductor devices [1], up to several thousand kilometres, influencing sound propagation through the ocean [2]. It is also responsible for the appearance of large and hazardous freak waves and tsunamis [3]. Here, we address the question of how many branches can be observed on average as a function of distance from an ordered source. We derive a universal curve for this quantity which applies to a wide range of parameters and correlation functions of the underlying disorder [4].

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[2] M. Wolfson & S. J. Tomsovich, Acous. Soc. Am., **109**, 2693 (2001)
[3] M. V. Berry , New J. Phys. **7**, 129 (2005); M. V. Berry, Proc. R. Soc. A **463**, 3055 (2007); E. J. Heller, L. Kaplan & A. Dahlen, J. Geophys. Res., **113**, C09023 (2008)
[4] J. J. Metzger, R. Fleischmann and T. Geisel, in preparation

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