

Abstract Submitted
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Merging theory with experiment: improving the accuracy of scaling theories YAN-JIUN CHEN, STEFANOS PAPANIKOLAOU, JAMES P. SETHNA, LASSP, Cornell University, GIANFRANCO DURIN, INRIM and ISI foundation, Torino, Italy, STEFANO ZAPPERI, INFN-CNR, Modena and ISI foundation Torino, Italy — Motivated by the experimental problem of analyzing data of Barkhausen noise collected through a limited field of view, we have developed a flexible software environment, SloppyScaling, which fits multi-variable scaling functions to both experimental and simulation data. We've used this to test our proposed two-variable scaling functions against simulations on interface depinning models, enabling experiments to make better predictions. Importance sampling algorithms allow us to estimate exponents with honest error bars and improved confidence. Furthermore, we've discovered its utility as a theorist's playground: it allows us to easily identify corrections to scaling, add them to our theory, and explore crossovers away from well-understood scaling behavior.

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