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Allan Sly*, Fine Hall, Department of Mathematics, Princeton University, Princeton, NJ, and
Riddhipratim Basu and **Shirshendu Ganguly**. *Upper Tail Large Deviations in First Passage Percolation*.

For first passage percolation on Z^2 with i.i.d. bounded edge weights, we consider the upper tail large deviation; that is the rare event where the first passage time between two points at distance n , is macroscopically larger than typical. While the lower tail rate function was established by Kesten (1986) the upper tail had remained open. We show that under mild regularity assumption on the passage time distribution, the rate function for upper tail large deviation indeed exists. The proof is carried out by effectively dilating the large deviation environment to compare the upper tail probabilities for various values of n . The key new tool is to show that for each subsequential metric limit for the large deviation event, there is some scale in which the metric is locally well behaved almost everywhere. (Received February 12, 2018)