Minimum degree edge-disjoint Hamilton cycles in random directed graphs

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At most how many edge-disjoint Hamilton cycles does a given directed graph contain? A trivial upper bound is the minimum between the minimum out- and in-degrees. We show that a typical random directed graph $D(n,p)$ contains precisely this many edge-disjoint Hamilton cycles, given that $p >= (\log^C n)/n$ where C is a fixed integer, which is optimal up to a factor of polylog n. Our proof provides a randomised algorithm to generate the cycles and uses a (relatively) recent "online sprinkling" idea, as was introduced by Ferber and Vu, to generate $D(n,p)$, allowing us to control some key properties of the graph.

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