The maximal degree of random unlabelled series-parallel graphs

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Series-parallel graphs are graphs that do not admit K_4 as a minor. They form a subclass of planar graphs, which is generally easier to analyse. Therefore, studying unlabelled series-parallel graphs is a natural first step before addressing the challenges of unlabelled planar graphs. Unlabelled classes are typically more difficult to analyse as symmetry play a role. That is why we use cycle-pointing methods, and we derive a precise estimate for the maximal degree of uniformly random unlabelled series-parallel graphs. Our approach employs tools from analytic combinatorics to establish an upper bound, and a probabilistic method using the Pólya-Boltzmann sampler to determine the lower bound. This is a joint work with Michael Drmota, Veronika Kraus, Konstantinos Panagiotou and Benedikt Stufler.