A Necessary and Sufficient Condition for the Lambda-Coalescent to Come Down from Infinity.

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Abstract

Let Π_{∞} be the standard Λ-coalescent of Pitman, which is defined so that $\Pi_{\infty}(0)$ is the partition of the positive integers into singletons, and, if Π_n denotes the restriction of Π_{∞} to $\{ 1, \ldots, n \}$, then whenever $\Pi_n(t)$ has b blocks, each k-tuple of blocks is merging to form a single block at the rate $\lambda_{b,k}$, where $\lambda_{b,k} = \int_0^1 x^{k-2} (1-x)^{b-k} : \Lambda(dx)$ for some finite measure Λ. We give a necessary and sufficient condition for the Λ-coalescent to ``come down from infinity'', which means that the partition $\Pi_{\infty}(t)$ almost surely consists of only finitely many blocks for all $t > 0$. We then show how this result applies to some particular families of Λ-coalescents.

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