On decomposition thresholds for odd-length cycles

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An (edge) *decomposition* of a graph G is a set of subgraphs of G whose edge sets partition the edge set of G. I will discuss our recent proof that, for each odd $\ell \geq 5$, any graph G of sufficiently large order n with minimum degree at least $\big(\frac{1}{2} + \frac{1}{2\ell-4} + o(1)\big)n$ has a decomposition into ℓ-cycles if and only if ℓ divides $|E(G)|$ and each vertex of G has even degree. This threshold cannot be improved beyond $\frac{1}{2} + \frac{1}{2\ell-2}$. It was previously shown that the thresholds approach $\frac{1}{2}$ as ℓ becomes large, but our thresholds do so significantly more rapidly. Our methods can be applied to tripartite graphs more generally and we also obtain some bounds for decomposition thresholds of other tripartite graphs.