

Edge distribution and density in the characteristic sequence.
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Abstract: The characteristic sequence of hypergraphs $\langle P_n : n < \omega \rangle$ associated to a formula $\phi(x; y)$ is defined by $P_n(y_1, \dots, y_n) = (\exists x) \bigwedge_{i \leq n} \phi(x; y_i)$. We show that graph-theoretic techniques, notably Szemerédi's celebrated regularity lemma, can be naturally applied to the study of model-theoretic complexity via the characteristic sequence. Specifically, we relate classification-theoretic properties of ϕ and of the P_n (considered as formulas) to density between components in Szemerédi-regular decompositions of graphs in the characteristic sequence. In addition, we use Szemerédi regularity to calibrate model-theoretic notions of independence; this sheds light on the interplay of independence and order in unstable theories.