

Abstract:

Reformulated Ramsey relations and \aleph_2

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We describe two variants of the classical Ramsey relation $\mu \rightarrow (\lambda)_\kappa^2$ which we denote by the arrows \rightarrow_{hc} and \rightarrow_{wc} . Positive relations follow for each from the corresponding relation $\mu \rightarrow (\lambda)_\kappa^2$; these variants are, however, *mild* weakenings of the Ramsey arrow in the sense that consistently, the infinite partition relations associated to these three arrows entirely coincide. Whether or how these arrows may consistently differ is the more interesting question, one necessarily involving large cardinal considerations and meaningfully beginning at the cardinal \aleph_2 . Each of these arrows in fact has its origin in combinatorics operative in homology computations in forcing iterations of length at least ω_2 . This is a motivation we'll briefly describe, along with some recent results and the central open question remaining. For concreteness, we close this abstract with a definition: a graph (V, E) is *highly connected* if it remains connected after the deletion of fewer than $|V|$ vertices. Write $\mu \rightarrow_{hc} (\lambda)_\kappa^2$ if any coloring of the edges of the complete graph on μ in κ many colors contains a monochromatic highly connected subgraph of size λ . For which μ , λ , and κ does this relation hold?