

Fast draws in strong games

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For an r -uniform hypergraph H , the strong Ramsey game $SR(H, n)$ is a two player game defined as follows. The game is played on the edges of a complete r -uniform, n -vertex hypergraph K_n^r , and the players alternately claim edges of K_n^r . The first player to claim a copy of H wins the game. If neither player is able to build a copy of H , then the game is declared a draw. By an argument known as strategy stealing, the starting player is guaranteed at least a draw in $SR(H, n)$ for every n and H . Moreover, it follows from Ramsey's Theorem that for fixed H and sufficiently large n there is no drawing position in $SR(H, n)$. Therefore we know that the starting player wins the game as long as n is sufficiently large. However whether the number of moves the starting player needs to win $SR(H, n)$ should depend on n . When H is a (2-uniform) complete graph, Beck conjectured that there is some function $f(q)$ such that for sufficiently large n , the starting player wins $SR(Kq, n)$ in less than $f(q)$ moves. This seminar will be about producing a hypergraph H for which starting player needs linearly many moves to win $SR(H, n)$. This is joint work with Hefetz, Kusch, Narins, Requilé, and Sarid.