Improved bounds on the multicolor Ramsey numbers of paths and even cycles

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We study the multicolor Ramsey numbers for paths and even cycles, $R_k(P_n)$ and $R_k(C_n)$, which are the smallest integers N such that every coloring of the complete graph K_N has a monochromatic copy of P_n or C_n respectively. For a long time, $R_k(P_n)$ has only been known to lie between $(k - 1 + o(1))n$ and $(k + o(1))n$. A recent breakthrough by Sárközy and later improvement by Davies, Jenssen and Roberts give an upper bound of $(k - \frac{1}{4} + o(1))n$. In this talk I show how to improve the upper bound to $(k - \frac{1}{2} + o(1))n$. Our approach uses structural insights in connected graphs without a large matching.