

# Multicoloring of random hexagonal graphs

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In the frequency allocation problem, we are given a mobile telephone network, whose geographical coverage area is divided into cells, wherein phone calls are serviced by assigning frequencies to them so that no two calls emanating from the same or neighboring cells are assigned the same frequency. The problem is to use the frequencies efficiently, i.e., minimize the span of frequencies used. The frequency allocation problem can be regarded as a multicoloring problem on a weighted hexagonal graph. In 1999, Colin McDiarmid and Bruce Reed asked the following question: is the ratio  $9/8$  of multichromatic number to weighted clique number asymptotically the worst (greatest) possible for hexagonal graphs. With Janez Zerovnik I already proved this for a large class of hexagonal graphs, but not in general cases (open problem). Now we introduce a random hexagonal graph and prove that for this kind of graph this hypothesis is true with very high probability (almost sure).