

SOME OPEN PROBLEMS IN HYPERGRAPH COLORING

V. Voloshin, Troy University, Troy, Alabama

We survey some results and open problems on mixed hypergraphs that are hypergraphs with two types of edges, see the Mixed Hypergraph Coloring Web Site at <http://spectrum.troy.edu/~voloshin/mh.htm>. In a proper vertex coloring, the edges of the first type must not be monochromatic, while the edges of the second type must not be polychromatic. Combination of these constraints creates many unusual properties of colorings. For instance, hypergraphs occur that are uncolorable, or that admit colorings with certain numbers k' and k'' of colors but no colorings with exactly k colors for any $k' < k < k''$. The last is called the gap in the chromatic spectrum. We will survey the results and open problems related to the gaps in the chromatic spectrum.