Abstract

A *mixed hypergraph* is a triple $\mathcal{H} = (X, \mathcal{C}, \mathcal{D})$, where X is the *vertex set*, and each of $\mathcal{C}, \mathcal{D}$ is a list of subsets of X. A *strict t-coloring* is a onto mapping from X to $\{1, 2, \ldots, t\}$ such that each $C \in \mathcal{C}$ contains two vertices have a common value and each $D \in \mathcal{D}$ has two vertices have distinct values. If $\mathcal{H}$ has a strict t-coloring, then $t \in S(\mathcal{H})$, such $S(\mathcal{H})$is called the *feasible set* of $\mathcal{H}$, and k is a *gap* if there are a value larger than k and a value less than k in the feasible set but k is not.

We find the minimum and maximum gap of a mixed hypergraph with more than 5 vertices. Then we consider two special cases of the gap of mixed hypergraphs. First, if the mixed hypergraphs *is spanned by* a complete bipartite graph, then the gap is decided by the size of bipartition. Second, the (l, m)*-uniform* mixed hypergraphs has gaps if $l > \lceil \frac{m}{2} \rceil \geq 2$, and we prove that the minimum number of vertices of a (l, m)-uniform mixed hypergraph which has gaps is $\lceil \frac{m}{2} \rceil (l-1) + m$.