

1146-05-301

Linyuan Lu*, Leconte College, 1523 Greene Street, Columbia, SC 29208-0001, and **Zhiyu Wang**, SC 29208-0001. *On the cover Ramsey number of Berge hypergraphs.*

For a fixed set of positive integers R , we say \mathcal{H} is an R -uniform hypergraph, or R -graph, if the cardinality of each edge belongs to R . An R -graph \mathcal{H} is *covering* if every vertex pair of \mathcal{H} is contained in some hyperedge. For a graph $G = (V, E)$, a hypergraph \mathcal{H} is called a *Berge- G* , denoted by BG , if there exists an injection $f : E(G) \rightarrow E(\mathcal{H})$ such that for every $e \in E(G)$, $e \subseteq f(e)$. In this note, we define a new type of Ramsey number, namely the *cover Ramsey number*, denoted as $\hat{R}^R(BG_1, BG_2)$, as the smallest integer n_0 such that for every covering R -uniform hypergraph \mathcal{H} on $n \geq n_0$ vertices and every 2-edge-coloring (blue and red) of \mathcal{H} , there is either a blue Berge- G_1 or a red Berge- G_2 subhypergraph. We show that for every $k \geq 2$, there exists some c_k such that for any finite graphs G_1 and G_2 , $R(G_1, G_2) \leq \hat{R}^{[k]}(BG_1, BG_2) \leq c_k \cdot R(G_1, G_2)^3$. Moreover, we show that for each positive integer d and k , there exists a constant $c = c(d, k)$ such that if G is a graph on n vertices with maximum degree at most d , then $\hat{R}^{[k]}(BG, BG) \leq cn$. (Received January 25, 2019)