Sum choice number of generalized θ-graphs

Ch. Brause[(a)], A. Kemnitz[(b)], M. Marangio[(b)], A. Pruchnewski[(c)], Margit Voigt* [(d)]

(a) Technical University Freiberg, (b) Technical University Braunschweig,
(c) Technical University Ilmenau, (d) University of Applied Sciences Dresden

Let $G = (V, E)$ be a simple graph and for every vertex $v \in V$ let $L(v)$ be a set (list) of available colors. G is called *L-colorable* if there is a proper coloring φ of the vertices with $\varphi(v) \in L(v)$ for all $v \in V$. A function $f : V \to \mathbb{N}$ is called a *choice function* of G and G is said to be *f-list colorable* if G is L-colorable for every list assignment L with $|L(v)| = f(v)$ for all $v \in V$. The *size* of a choice function is defined by $\text{size}(f) = \sum\limits_{v \in V} f(v)$ and the *sum choice number* $\chi_{sc}(G)$ denotes the minimum size of a choice function of G.
Sum list colorings were introduced by Issak in 2002 and got a lot of attention since then.
For $r \geq 3$ a *generalized* $\theta_{k_1 k_2 \ldots k_r}$*-graph* is a simple graph consisting of two vertices v_1 and v_2 connected by r internally vertex disjoint paths of length $k_1, k_2, \ldots, k_r$ ($k_1 \leq k_2 \leq \cdots \leq k_r$).
In 2014, Carraher et al. determined the sum-paintability of all generalized θ-graphs which is an online-version of the sum choice number and consequently an upper bound for it.
In this talk we give sharp upper bounds for the sum choice number of all generalized θ-graphs with $k_1 \geq 2$.

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