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Duality on hypermaps with symmetric or alternating monodromy group

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Abstract

Duality is the operation that interchanges hypervertices and hyperfaces on oriented hypermaps. The *duality index* measures how far a hypermap is from being self-dual. We say that an oriented regular hypermap has *duality-type {l, n}* if l is the valency of its vertices and n is the valency of its faces. Here, we study some properties of the duality index of oriented regular hypermaps and we prove that for each pair $n, l \in N$, with $n, l \geq 2$ (but not both equal to 2), it is possible to find an oriented regular hypermap with extreme duality index and of duality-type *{l, n}*, even if we are restricted to hypermaps with alternating or symmetric monodromy group.

Ključne besede: Hypermaps, duality, primitive groups, alternating group, symmetric group, generators.

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Povzetek

Dualnost je operacija, ki medsebojno zamenja hipervozlišča in hiperlica orientabilnih hiperzemljevidov. *Dualnostni indeks* meri, kako zelo se hiperzemljevid razlikuje od sebi-dualnega. Pravimo, da ima orientabilen regularen hiperzemljevid *dualnostni tip {l, n}*, če je *l* valenca njegovih točk in *n* valenca njegovih lic. Tu preučujemo nekatere lastnosti dualnostnega indeksa orientabilnih regularnih hiperzemljevidov in dokažemo, da je za vsak par $n, l \in N$, kjer sta $n, l \geq 2$ (a ne oba hkrati enaka 2), mogoče poiskati orientabilen regularen hiperzemljevid z ekstremnim dualnostnim indeksom in dualnostnega tipa *{l, n}*, tudi če se omejimo na hiperzemljevide z alternirajočo ali simetrično monodromijsko grupo.

Ključne besede: Hiperzemljevidi, dualnost, primitivne grupe, alternirajoča grupa, simetrična grupa, generatorji.