
On the Derivatives of Central Loops

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Abstract

The right (left) derivative, a^{-1} , e - and e, a^{-1} -isotopes of a C-loop are shown to be C-loops. Furthermore, for a central loop (L, F) , it is shown that $\{F, Fa^{-1}, Fa^{-1}, e\}$ and $\{F, Fa^{-1}, Fe, a^{-1}\}$ are systems of isotopic C-loops that obey a form of generalised distributive law. It is proved that for a loop (L, θ) to be an LC(RC, C)-loop, it is necessary and sufficient for the parastrophe (L, θ^*) to be a RC(LC, C)-loop. Hence, isotopes (L, \otimes) and (L, \square) of (L, θ) and (L, θ^*) respectively are proved to be isotopic if either (L, \otimes) or (L, \square) is commutative. It is shown that C-loops are isotopic to some finite in decomposable groups of the classes $D_i, i = 1, 2, 3, 4, 5$ and that the center of such C-loops have a rank of 1, 2 or 3.

Keywords

LC-loop, RC-loop, C-loop, commutativity, derivatives, isotopism, central loop, distributive law.