

LOOPS WITH COMMUTING INNER MAPPINGS AND AUTOMATED DEDUCTION

Michael Kinyon

University of Denver and Universidade Aberta

e-mail: mkinyon@math.du.edu

Resumo:

In the past 15 years, automated deduction tools such as PROVER9 and finite model builders such as MACE4 have increasingly played an important role in finding new results in loop theory. A *loop* is a quasigroup with an identity element, that is, it is a set Q with a binary operation \cdot such that for each $a, b \in Q$, the equations $a \cdot x = b$ and $y \cdot a = b$ have unique solutions $x, y \in Q$. (Besides groups, probably the class of loops best known to people outside the field are Moufang loops.)

In this talk, I will focus on a major automated deduction project in loop theory which is pushing all the available software to its limits: the AIM project (AIM = Abelian Inner Mappings). The problem is to find the correct loop theoretic generalization of the classical group theory fact that a group is nilpotent of class at most 2 if and only if its inner automorphism group is abelian. Progress toward the main conjectures in the loop setting has been slow but substantial, and I will concentrate on recent work. No background in either loop theory or automated deduction will be assumed of the audience.

palavras-chave: Loops, automated reasoning.