



GROUPS, LOGIC, AND COMPUTATION. GAGTA-2025

Lev Shneerson

Hunter College of CUNY

On identities and free subsemigroups of inverse semigroups with zero defined by positive relations.

June 6–13, 2025

Abstract:

In the 1960's S.I. Adian initiated the study of abstract properties of monoids given by special presentations in which the right-hand sides or defining relations are empty. In particular, he established that up to isomorphism there are only two special monoids with nontrivial identities that are not groups.

Most part of this talk will be focused on a similar problem for the special Rees quotients of free inverse semigroup FI_A over the alphabet A , i.e. inverse semigroups with zero given by presentations of the form $S = \langle A \mid C_i = 0 \ (i = 1, 2, \dots) \rangle$ where each C_i is a positive word over the group alphabet $A \cup A^{-1}$. We completely describe all cases when S satisfies a nontrivial identity (including the identities in signature with involution). In each of them S is finitely presented in the class of inverse semigroups.

We also give a new sufficient condition for which a finite set X of reduced words over $A \cup A^{-1}$ freely generates a free inverse subsemigroup of FI_A and use it in our proofs.

This is a joint work with David Easdown (University of Sydney).