

Title: Prime Decomposition Theorem for Finite Idempotent Semirings Using the Triangular Product of B. I. Plotkin

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Abstract: A Prime Decomposition Theorem for finite idempotent semirings is proved using the triangular product of Plotkin adapted to semirings. A pair of results referred to as the Triangular Decomposition Theorem and the Ideal Decomposition Theorem are presented. Applying these in the context of idempotent semirings yields the decomposition half of the Prime Decomposition Theorem for idempotent semirings.

Further portions of the talk are devoted to proving matrix algebras over the power set of a finite group are irreducible with respect to the triangular product. A moral of the talk is that much more of ring theory works over semirings than one might expect. Applications to computing group complexity of the power set of a finite semigroup are given.

This is new joint research with Benjamin Steinberg and is covered in Chapter 9 of our book 'The q -Theory of Finite Semigroups' Springer 2008.