

CONSTRUCTION OF ROTA^m-ALGEBRAS AND BALLOT^m-ALGEBRAS FROM ASSOCIATIVE
ALGEBRAS WITH A ROTA-BAXTER MORPHISM AND A ROTA-BAXTER OPERATOR OF
WEIGHTS THREE AND TWO

Wilson Arley Martinez

Universidad del Cauca, Colombia

wamartinez@unicauca.edu.co

We give a generalization of Rota-Baxter Operators and introduce the notion of a Ballot^m-algebra. Free Rota-Baxter algebras on a set can be constructed from a subset of planar rooted forests with decorations on the angles. We give similar constructions for obtaining an associative algebra in terms of planar binary trees with a modified Rota-Baxter Operator, and so we construct a Ballot^m-algebra.

We introduce the concepts of a Rota-Baxter Morphism, Dyck^m-algebra and Rota^m-algebra. An element u is said to be idempotent with respect to product \cdot in the algebra if: $u \cdot u = u$, and it is a left identity if $x \cdot u = x$ for all element x in the algebra. Associative algebras with a left identity that simultaneously is a element idempotent, permit us to present examples of a Rota-Baxter Morphism and so we can construct a Rota^m-algebra.

We stress that the construction of Ballot^m-algebras and Rota^m-algebras from associative algebras with a generalitaton of Rota-Baxter Operators are some of the main results of this work.