

# Rota-Baxter Type Operators on Algebras

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## Abstract

Linear operators play essential role in modern mathematical and physical sciences. The notion of Rota-Baxter operator as natural generalization of by parts integration formula arise in a seminal paper of G. Baxter.

The linear map  $P : A \rightarrow A$  on an algebra  $A$  is called a *Rota-Baxter operator* of weight  $\lambda$  if

$$P(x) \cdot P(y) = P(xP(y) + P(x)y + \lambda xy).$$

This project studies Rota-Baxter type operators on algebras. The description of Rota-Baxter operators and other Rota-type operators is a major problem.

Let  $A = FG$  be the group algebra of a finite group  $G$  over a field  $F$ . Our aim is to investigate the properties of Rota-type operators on the modular group algebra  $FG$ , i.e., algebras in which the characteristic of the ground field  $F$  divides the order of the group  $G$ . Of particular interest is the case when the characteristic of  $F$  is two.