

Algebra Seminar

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Room HH-3017

GENERALIZED MONOID RINGS AND OTHER RING EXTENSIONS

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Abstract

We get a skew polynomial ring over a ring A by defining a skew multiplication by a condition

$$xa = b + cx$$

and requiring associativity. Then associating with each a the corresponding c, b defines, respectively, an endomorphism f and an (f, id) derivation d of A . Conversely for any such f, d we get an associative multiplication by defining

$$xa = d(a) + f(a)x.$$

We generalize this to monoid rings, using a family of self-maps of the coefficient ring to define a new multiplication for which coefficients and monoid elements need not commute. In this context what is usually called a skew monoid ring corresponds to a skew polynomial ring for which the derivation is the zero map.

The connections between our generalized monoid rings and some other types of ring extensions – normalizing extensions and subnormalizing extensions – will also be discussed.