Summary: Motivated by the Poisson Dixmier-Moeglin equivalence problem, a systematic study of commutative unitary rings equipped with a biderivation, namely a binary operation that is a derivation in each argument, is here begun, with an eye toward the geometry of the corresponding B-varieties. Foundational results about extending biderivations to localisations, algebraic extensions and transcendental extensions are established. Resolving a deficiency in Poisson algebraic geometry, a theory of base extension is achieved, and it is shown that dominant B-morphisms admit generic B-fibres. A bidifferential version of the Dixmier-Moeglin equivalence problem is articulated.

MSC:

13N15 Derivations and commutative rings
12H05 Differential algebra
16W25 Derivations, actions of Lie algebras
17B63 Poisson algebras

Keywords:

biderivation; Poisson bracket; D-variety; Dixmier-Moeglin equivalence

Full Text: DOI arXiv

References:

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