

# RECURSION OPERATORS AND HIERARCHIES OF NONCOMMUTATIVE KdV-TYPE EQUATIONS

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We explain an operator theoretic approach to construct simultaneous solutions to all equations of the noncommutative counterparts to the potential KdV, KdV and mKdV hierarchies. One of the main technical issues will be to take advantage of the recursive construction of these hierarchies. In an excursion, we will address general structural properties of the underlying recursion operator of the noncommutative KdV equation. In the applications part, we will discuss both the classical scalar hierarchies (countable nonlinear superposition) and matrix hierarchies (generalized multisoliton solutions).

Large parts of the talk are based on recent joint work in [1], [2] with Sandra Carillo, Roma 1.

## References

- [1] S. Carillo and C. Schiebold, *Noncommutative Korteweg-de Vries and modified Korteweg-de Vries hierarchies via recursion methods*, J. Math. Phys. 50 (2009), 073510 (pp.14).
- [2] S. Carillo and C. Schiebold, *Matrix KdV and mKdV hierarchies: Noncommutative soliton solutions and explicit formulae*, J. Math. Phys., to appear.