

Valued differential fields of exponential logarithmic series.

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Abstract.

Consider the valued field $\mathbb{R}((\Gamma))$ of generalised series, with real coefficients and monomials in a totally ordered multiplicative group Γ . In a series of papers, we investigated how to endow this formal algebraic object with the analogous of classical analytic structures, such as exponential and logarithmic maps, derivation, integration and difference operators. In this talk, we shall discuss *series derivations* and *series logarithms* on $\mathbb{R}((\Gamma))$ (that is, derivations that commute with infinite sums and satisfy an infinite version of Leibniz rule, and logarithms that commute with infinite products of monomials), and investigate compatibility conditions between the logarithm and the derivation, i.e. when the logarithmic derivative is the derivative of the logarithm.

References:

- Kuhlmann, Salma - Matusinski, Mickaël: Hardy type derivations in generalized series fields , submitted (2010).
Kuhlmann, Salma - Matusinski, Mickaël: Hardy type derivations on fields of exponential logarithmic series, (arXiv 1010.0896).