

Research project **DERTFG****Differential equations on p -adic curves and p -adic representations of the tempered fundamental group**

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Research project short description:

We would like to clarify the "geometric" case first, i.e. when the curve is defined over a p -adic algebraically closed field. In that case, a characterization of connections admitting a sheaf of solutions locally constant in the sense of the tempered étale topology, or at least the production of such connections, seems to us an interesting question. The "arithmetic" case seems much more difficult. In that case, we look for an explanation of the "philosophical" reason for the new geometric variable gained by Berger on the Robba ring. Finally, we would like to understand the generalization of that construction in the case of a representation of the tempered fundamental group of an affinoid curve defined over a finite extension of \mathbf{Q}_p .

References:

André, Y.: *Period mappings and differential equations. From \mathbf{C} to \mathbf{C}_p* , MSJ Memoirs, Vol. 12, 2003.

Andreatta, F., Iovita, A. : *Global applications of relative (φ, Γ) -modules I*, Astérisque 319(2008), p. 339-420.

Berger, L. *Représentations p -adiques et équations différentielles*, Invent. Math. **148** (2002), p. 219-284.