"Continuity of radius of convergence of p-adic differential equations on curves"

"The notion of "maximal common radius of convergence" of local solutions of a p-adic differential equation was one of the central points in the work of Dwork and Robba. It has led to important results on the index and factorization of linear differential operators with p-adic analytic coefficients. Christol-Mebkhout have pushed the study of the radius of convergence along the skeleton of a p-adic annulus, to obtain for p-adic differential operators a slope decomposition analog to the one of ℓ-adic local systems.

We show how the notion of radius of convergence admits a natural intrinsic formulation in the framework of Berkovich non-archimedean analytic geometry. Using the theory of semistable reduction, we prove global continuity of that function. We deduce a definition of p-adic irregularity for connections, not necessarily representing (over)convergent isocrystals, which behaves as "ramification along the characteristic p fiber".

We expect that, at least for coefficients arising from finite etale coverings of a closed p-adic annulus or of a smooth projective p-adic curve, the differential slope decomposition leads to the same local decompositions as the Huber-Ramero galois ramification theory."