

Title: p -adic Gamma and Beta functions in étale and crystalline cohomologies.

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Summary:

1. The classical “Boyarsky Principle”: families of overconvergent F -isocrystals on a smooth scheme of characteristic $p > 0$, parametrized by the characters of the geometric fundamental group of order prime to p .

2. Examples: the Morita p -adic Gamma and Beta functions, Dwork’s p -adic hypergeometric functions.

3. p -adic Galois representations parametrized by the characters of the geometric fundamental group of a smooth scheme of characteristic 0.

4. Example: The tower of Fermat curves over \mathbb{Q}_p . Ihara-Anderson theory of p -adic étale Gamma and Beta functions.

5. Generalization of 1: families of p -adic differential equations with an operation of the Weil group. Generalization of the Boyarky Principle.

6. Example: Coleman’s p -adic Beta and Gamma functions. Coleman’s Beta ia a cocycle of the Weil group.

7. Towers of coverings with potentially good reduction. Trivialization of cocycles of the Weil group and of the absolute Galois group via Fontaine’s periods.

8. Example: Ihara’s p -adic étale Beta cocycle and Coleman’s potentially crystalline Beta cocycle, are trivialized by the periods of Fermat curves in $\overline{\mathbb{Q}_p} \otimes B_{crys}$.