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A p-adic Shimura isomorphism and p-adic periods of modular forms. (English) ⎡Zbl 0838.11033⎤

Let f be a cuspidal Hecke eigenform of integral weight $k \geq 2$ on $\Gamma_1(Np)$ ($N \in \mathbb{N}, p$ a prime not dividing N). Using the rigid p-adic analytic uniformization of the abelian variety attached to f, B. Mazur, J. Tate and J. Teitelbaum defined a certain p-adic invariant $\mathcal{L}_p(f)$ in the case $k = 2$ which plays an important role in p-adic analogues of the conjectures of Birch and Swinnerton-Dyer and conjectures about exceptional zeros of the p-adic L-functions of f. An analogous quantity $\mathcal{L}_p(f)$ also was conjecturally defined for even $k > 2$. On the other hand, if N is squarefree and has an even number of prime factors, for arbitrary $k \geq 2$ in [*J. Teitelbaum*, Invent. Math. 101, 395-410 (1990; Zbl 0731.11065)] an invariant $\widetilde{\mathcal{L}}_p(f)$ was defined using the p-adic uniformization of the corresponding Shimura curve. It was shown that $\widetilde{\mathcal{L}}_p(f) = \mathcal{L}_p(f)$ if $k = 2$.

In the present paper, the author defines an invariant $\widehat{\mathcal{L}}_p(f)$ for arbitrary k and N. The definition is formally analogous to that of $\widetilde{\mathcal{L}}_p(f)$, however one uses the rigid geometry of the modular curve itself rather than that of the Shimura curve. In weight 2 one has $\widehat{\mathcal{L}}_p(f) = \widetilde{\mathcal{L}}_p(f)$. One conjectures that all three invariants should coincide whenever they are defined.

For the entire collection see [Zbl 0794.00016].

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MSC:

11F67	Special values of automorphic L-series, periods of automorphic forms, cohomology, modular symbols
11F85	p-adic theory, local fields
11F11	Holomorphic modular forms of integral weight

Cited in **3** Reviews
Cited in **16** Documents

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p-adic invariant; p-adic L-functions; cuspidal Hecke eigenform; modular curve