

[Hida, Haruzo](#)

**Modular  $p$ -adic  $L$ -functions and  $p$ -adic Hecke algebras.** (English. Japanese original)

[Zbl 0811.11040](#)

Transl., Ser. 2, Am. Math. Soc. 160, 125-154 (1994); translation from Sūgaku 44, No. 4, 289-305 (1992).

This is a survey article for  $p$ -adic  $L$ -functions of algebraic groups and  $p$ -adic Hecke algebras.

The author discusses how the number of variables for  $L$ -functions is determined by algebraic groups. Starting with Riemann's zeta function and the Kubota-Leopoldt  $p$ -adic  $L$ -function, he interprets them as functions on characters for some suitable groups. Then he goes on to consider  $L$ -functions for cuspidal irreducible representations appearing in the space of cusp forms  $L_2^0(\xi)$  from the right regular representation of  $\mathrm{GL}_n(\mathbb{A})$  where  $\mathbb{A}$  is the ring of adeles of  $\mathbb{Q}$ . He confirms that one variable is enough for the above  $L$ -functions. After explaining the Langlands conjecture, he introduces a  $p$ -analogue of  $L_2^0(\xi)$  and the  $p$ -adic Hecke algebras for  $\mathbb{Q}$  and then for arbitrary number fields. There he finds  $p$ -adic  $L$ -functions whose number of variables needs to be more than one. Several results are stated with short proofs. Along the line he also discusses under certain conditions how to construct the maximal  $\mathrm{GL}(2)$  extension unramified outside  $p$  over a number field.

Nine open questions and one conjecture are given.

Reviewer: [K.I.Ohta \(Tokyo\)](#)

**MSC:**

[11F85](#)  $p$ -adic theory, local fields

[11S37](#) Langlands-Weil conjectures, nonabelian class field theory

[20G25](#) Linear algebraic groups over local fields and their integers

Cited in 4 Documents

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survey;  $p$ -adic  $L$ -function of algebraic groups;  $p$ -adic Hecke algebras; cuspidal irreducible representations

**Full Text:** [DOI](#)