

Research results Kengo Fukunaga

Let p be an odd prime. Triple product L -functions attached to triplets of modular forms have Euler products and functional equations. We have studied p -adic triple product L -functions which are p -adic analytic functions interpolating an infinite number of central critical values of triple product L -functions attached to triplet of modular forms.

Proceeding research

Let f be an ordinary cusp form. Haruzo Hida constructed a Hida family F attached to f which was a p -adic family of ordinary cusp forms. The Hida family F which interpolates f is unique. Let (f, g, h) be a triple of ordinary cusp forms. Then there exists the triple (F, G, H) of Hida families attached to (f, g, h) . Ming-Lun Hsieh constructed a p -adic triple product L -function attached to (F, G, H) in [Hsi17]. As a generalization of Hida family, Coleman families were defined in [Corollary B5.7.1, Col97]. Let f be a cusp form which is not ordinary. Then we can construct a Coleman family F which interpolates f uniquely.

Main results

Let (f, g, h) be a triple of cusp form of weight (k, l, m) . If there exists a triangle with sides (k, l, m) , we say that the triple (f, g, h) satisfies a balanced condition. Otherwise, we say that the triple (f, g, h) satisfies an unbalanced condition. If a p -adic triple product L -function interpolates central critical values of triple product L -functions attached to triples of cusp forms satisfying the balanced condition (resp. unbalanced condition), the p -adic triple product L -function is called the balanced (resp. unbalanced) p -adic triple product L -function. In [Fuk19], we generalized his results [Hsi17] under unbalanced p -adic triple product L -functions. Let F be a Hida family and G, H general p -adic families of cusp forms. We constructed a unbalanced p -adic triple product L -function attached to (F, G, H) . In the previous research [Hsi17], he constructed unbalanced p -adic triple product L -functions attached to triples of Hida families. In our result, we can take more general p -adic families for G, H . For example, we can take Hida families, Coleman families or CM-families as an examples of G, H .

Reference

- [Col97] R. F. Coleman, p -adic Banach spaces and families of modular forms. Invent. Math., 127(3):417-479, 1997.
- [Fuk19] K. Fukunaga, Triple product p -adic L -function attached to p -adic families of modular forms, arxiv:1909.03165.
- [Hsi17] M.-L. Hsieh, Hida families and p -adic triple product L -functions, AJM, to appear.