Research Highlight: Archimedean non-vanishing, cohomological test vectors, and standard L-functions of GL_2n: complex case

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A classical formula of Euler says the value of the Riemann-Zeta function at the even positive integer *2k* is equal to a rational multiple of $(2\pi i)^{2k}$. Results of this kind is called the period relation of an automorphic L-function. When the automorphic representation is cohomological, then such a period relation can be studied via integral representations of the L-function and cohomological method.

The goal of this paper [1] is to establish a uniform cohomological test vector for a newly constructed integral $\lambda_{s,\chi}$, which turns out to be the local Friedberg-Jacquet integral at complex places. The result obtained in this paper is a key ingredient in the big project of period relations of the twisted standard L-function of GL_{2n} of symplectic type [2], where the first unconditional result of automorphic L-function of high degree is obtained.

References:

[1] B. Lin, F. Tian, Archimedean Non-vanishing, Cohomological Test Vectors, and Standard L-functions of GL_{2n}: Complex Case, Adv. Math. 369 (2020), 107189, 51 pp.

[2] D. Jiang, B. Sun and F. Tian, Period Relations of Standard L-functions of Symplectic Type, preprint. https://arxiv.org/abs/1909.03476.