FUTURE RESEARCH

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0.1. **Generalizations of results in** [1] **and** [2]**.** Only the equal weight case is considered in [2]. This restriction comes from a difficulty in computing explicitly the archimedean local zeta integral. In [1], the archimedean component σ_∞ is restricted to the trivial representation. This restriction arises from a similar difficulty.

I plan to work on removing these restrictions. Namely I would like to extend the results in [2] to mixed weight and vector valued cases, and, also would like to extend [1] to cases where σ_∞ is an arbitrary finite dimensional representation and to other critical points. Moreover I would like to prove the $\mathrm{Gal}(\overline{\mathbb{Q}}/\mathbb{Q})$ equivariance of the algebraic part of the special values in [1], by looking more carefully at the Fourier coefficients of the Eisenstein series.

0.2. **L-functions for** $U(V) \times \mathrm{GL}_2$ **and** $\mathrm{Sp}_n \times \mathrm{GL}_2$**.** In [1], we studied special values of L-functions for $\mathrm{SO}(V) \times \mathrm{GL}_2$ where V is an orthogonal vector space over $\mathbb{Q}$ which is anisotropic over $\mathbb{R}$. I plan to study a similar problem for L-functions for $\mathrm{U}(V) \times \mathrm{GL}_2$ where V is a hermitian vector space over $\mathbb{Q}$ which is anisotropic over $\mathbb{R}$. More generally, we shall study L-functions for $\mathrm{U}(V) \times \mathrm{GL}_2$ for any hermitian space V. Similarly, it seems interesting to consider special values of L-functions for $\mathrm{Sp}_n \times \mathrm{GL}_2$.

References

[1] M. Furusawa and K. Morimoto: On special values of certain L-functions. Submitted.
[2] K. Morimoto: On L-functions for quaternion unitary groups of degree 2 and GL(2) (with an Appendix by M. Furusawa and A. Ichino). Accepted for publication in *Int. Math. Res. Not. IMRN*.