

**On zeta integrals related to Hasse-Weil  $L$ -functions of  
elliptic curves.**

Masatoshi Suzuki (Rikkyo Univ.)

The subject of this talk is the ‘boundary term’ of Fesenko’s two-dimensional zeta integrals which gives an integral representations of Hasse-Weil  $L$ -functions of elliptic curves.

It is known that the ‘boundary term’ can be expressed as the Laplace transform of certain function  $h(x)$ . The nonnegative property of the fourth log derivative of  $h(x)$  near  $x = 0$  is closely related to the Riemann hypothesis for the Hasse-Weil  $L$ -functions of elliptic curves.

In the case of the rational number field, we give an explicit series expansion of  $h(x)$  consisting of  $K$ -Bessel functions. Using this expansion, we investigate analytic properties of the fourth log derivative of  $h(x)$  near  $x = 0$ .