

The Shintani–Faddeev modular cocycle: Stark units from q -Pochhammer ratios

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We give a new interpretation of Stark units associated to real quadratic fields as special values of a modular cocycle described by complex meromorphic continuation of a simple infinite product. The cocycle encodes the modular transformations of the q -Pochhammer symbol and is related to the Shintani–Barnes double sine function and the Faddeev quantum dilogarithm. We prove a refinement of Shintani’s Kronecker limit formula that relates signed square roots of Stark class invariants to real multiplication values of the cocycle, which are cohomological invariants.