A Counter-Example in the Theory of Local Zeta Functions

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Abstract

The generalized Igusa local zeta function $Z_{\mathbf{Q}_p}(s)$ associated to (SL_7, ρ), where ρ is the Cartan product of the first, third and fifth fundamental representations of SL_7, is explicitly computed and shown not to satisfy the expected functional equation

$$Z_{\mathbf{Q}_p}(s)|_{p \mapsto p^{-1}} = p^{-7s} Z_{\mathbf{Q}_p}(s).$$