FORBIDDEN CONDUCTORS OF L-FUNCTIONS AND CONTINUED FRACTIONS OF PARTICULAR FORM

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Abstract: We show a connection between values of the conductor q of L-functions of degree 2 in the extended Selberg class and properties of certain continued fractions, parametrised by q, on which we define a positive-valued weight. We call a finite sequence of integers $\mathbf{m} = (m_0, \dots, m_k)$ a loop if

$$c(q, \mathbf{m}) = m_k + \cfrac{1}{qm_{k-1} + \cfrac{q}{qm_{k-2} + \cfrac{q}{\ddots + \cfrac{q}{qm_0}}}}$$

equals 0. It turns out that loops have a group structure and weight, when restricted to loops, is a group homomorphism. If it is non-trivial, then q is not a conductor of any L function of degree 2. We show several results on classes of forbidden qs, and also qs that do occur as conductors of L function of degree 2.

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