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Shintani zeta-functions and Gross-Stark units for totally real fields

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Abstract

Let F be a totally real number field and let p be a finite prime of F, such that p splits completely in the finite abelian extension H of F. Stark has proposed a conjecture stating the existence of a p-unit in F with absolute values at the places above p specified in terms of the values at zero of the partial zeta functions associated to H/F. Gross proposed a refinement of Stark's conjecture which gives a conjectural formula for the image of Stark's unit in F_p^{\times}/E , where F_p denotes the completion of F at p and E denotes the topological closure of the group of totally positive units of F. We propose a further refinement of Gross' conjecture by proposing a conjectural formula for the exact value of Stark's unit in F_p^{\times} .