

# Heegner points and Jochnowitz congruences on Shimura curves

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Given a rational elliptic curve  $E$ , a suitable imaginary quadratic field  $K$  and a quaternionic Hecke eigenform  $g$  of weight 2 obtained from  $E$  by level raising such that the sign in the functional equation for  $L_K(E, s)$  (respectively,  $L_K(g, 1)$ ) is  $-1$  (respectively,  $+1$ ), we prove a "Jochnowitz congruence" between the algebraic part of  $L'_K(E, 1)$  (expressed in terms of Heegner points on Shimura curves) and the algebraic part of  $L'_K(g, 1)$ . This establishes a relation between Zhang's formula of Gross-Zagier type for central derivatives of L-series and his formula of Gross type for special values. Our results extend to the context of Shimura curves attached to division quaternion algebras previous results of Bertolini and Darmon for Heegner points on classical modular curves.

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