

# THE GROSS--KOHLEN--ZAGIER THEOREM VIA $p$ -ADIC UNIFORMIZATION

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Let  $S$  be a set of rational places of odd cardinality containing infinity and a rational prime  $p$ . We can associate to  $S$  a Shimura curve  $X$  defined over  $\mathbb{Q}$ . The Gross--Kohlen--Zagier theorem states that certain generating series of Heegner points of  $X$  are modular forms of weight  $3/2$  valued in the Jacobian of  $X$ . We will state this theorem and outline a new approach to proving it using the theory of  $p$ -adic uniformization and  $p$ -adic families of modular forms of half-integral weight. This is joint work with Lea Beneish, Henri Darmon, and Lennart Gehrman.