CM values of Hilbert modular functions

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We will report on joint work with Tonghai Yang. About twenty years ago Gross and Zagier found an explicit formula for the prime factorization of the values of the classical j-function at CM points. As a corollary they were able to settle conjectures of Berwick on the divisibility of these values by powers of small primes. Here we consider the analoguous problem for certain rational functions on a Hilbert modular surface. We obtain a similar formula for the values at CM points associated to a (non-biquadratic) CM quartic field containing the underlying quadratic field of the Hilbert modular surface. It turns out that the prime factorization is determined by the arithmetic of the reflex field.