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Nickolas Andersen* (nandersen@math.ucla.edu) and **William Duke**. *Modular invariants for real quadratic fields and Kloosterman sums.*

We investigate the asymptotic distribution of integrals of the j -function that are associated to ideal classes in a real quadratic field. Twisted sums of these integrals appear as Fourier coefficients of mock modular forms of half-integral weight. To estimate the error term in our asymptotic formula, we prove a bound for sums of Kloosterman sums of half-integral weight that is uniform in every parameter. Along the way, we prove a new variant of Kuznetsov's formula where the spectral data is restricted to half-integral weight forms in the Kohnen plus space. (Received January 25, 2018)