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**Ken Ono\*** (ono@math.wisc.edu), Dept. of Mathematics, University of Wisconsin, Madison, WI 53706, and **Kathrin Bringmann**, Dept. Mathematics, University of Wisconsin, Madison, WI 53706. *Arithmetic of Maass-Poincare series.*

In an important paper, Zagier proved that the generating functions for traces of singular moduli, associated to polynomials in  $j(z)$ , are weight  $3/2$  modular forms on  $\Gamma_0(4)$ . There have been a number of generalizations, such as the recent work of Bruinier and Funke on generic modular curves. Here we consider a different kind of generalization. We show that Maass-Poincare series of half-integral weight are always generating functions of traces of suitably defined singular moduli. This work (joint with Kathrin Bringmann) includes Zagier's results as special cases. (Received September 06, 2005)