1035-11-224   **Jennifer Beineke*** (`jbeineke@wnec.edu`), Department of Mathematics, Western New England College, 1215 Wilbraham Road, Springfield, MA 01119, and **Daniel Bump** (`bump@math.stanford.edu`), Department of Mathematics, Stanford University, Stanford, CA 94305. *Modified Atkinson's Formulas for the Mean Square of the Riemann Zeta Function.*

In 1949, Atkinson determined an explicit formula for the error term in the asymptotic expansion of the second moment of the Riemann zeta function. Jutila then developed a modified version of Atkinson's formula for the square of the Riemann zeta function on the line $\mathrm{Re}(s) = 1/2$. We will describe an extension of Jutila's formula to other values of s. This result requires an approximate functional equation for a product of shifted zeta functions, and a smooth version of the Oppenheim summation formula. (Received August 20, 2007)