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Rupert L. Frank* (rlfrank@math.princeton.edu), Department of Mathematics, Fine Hall, Princeton University, Princeton, NJ 08544, and **Heinz Siedentop** and **Simone Warzel**. *The relativistic Scott correction.*

We consider relativistic many-particle operators which describe the electronic states of heavy atoms. Their ground state energy is investigated in the limit of large nuclear charge and velocity of light. We show that the leading quasi-classical behavior given by the Thomas-Fermi theory is raised by a subleading correction, the Scott correction. Our result is valid for the maximal range of coupling constants, including the critical one. (Received August 21, 2009)