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Stephen D Pankavich* (sdp@indiana.edu), 439 Rawles Hall, Department of Mathematics, Indiana University, Bloomington, IN 47401. *The Vlasov-Poisson System with Infinite Mass and Energy.*

The existence of a unique, global in time, classical solution to the Vlasov-Poisson system with fixed background is shown. As opposed to the traditional Vlasov-Poisson problem, the total charge and energy are infinite, and we must consider solutions which tend to the fixed background rather than zero, as $x \rightarrow \infty$. Thus, energy conservation (which is an essential component of global existence for the traditional problem) is unavailable. Instead, a previously known conserved quantity related to the energy, has been shown to be bounded, and is of similar use. The global existence proof combines energy and decay estimates, and a crucial argument which bounds the velocity support of the number density function. (Received August 30, 2005)