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**Tepper L Gill\*** (tgill@access4less.net), Department of E&CE and Mathematics, 2300 6th St. NW, Washington, DC 20059. *Foundations for the Thompson problem*. Preliminary report.

In 1972, P. D. Thompson used the amplitudes of a set of orthogonal eigenvalues on the two sphere as the co-ordinates in an infinite-dimensional phase space to model the climate over a region of earth. This allowed him to derive the probability distribution for an ensemble of randomly forced two-dimensional viscous flows as the solution of the continuity equation for the phase flow. He obtained a partial differential equation in infinitely many variables for the probability density. He was criticized, because mathematically the equation had no meaning at the time. The purpose of this talk is to discuss progress on this problem. (Received July 31, 2013)