

LECTURE 2:

q-Expectation values in nonextensive statistical mechanics

Sumiyoshi Abe

Institute of Physics, University of Tsukuba, Ibaraki 305-8571, Japan

Abstract: In nonextensive statistical mechanics, two kinds of definitions have been considered for expectation value of a physical quantity: one is the ordinary definition and the other is the so-called q-expectation value employing the escort distribution. In this lecture, it is shown that the correct one is the use of the q-expectation value. The proof is based on the Shore-Johnson theorem for consistency between the maximum entropy principle and the minimum cross-entropy (i.e., relative-entropy) principle.