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Does the Boltzmann distribution emerge from a thermal correspondence principle? SAMUEL ALTERMAN, WILLIAM WOOTTERS, Williams College — Consider a one-dimensional quantum particle in a box, in thermal equilibrium with a large environment. Even for moderate temperatures, one finds that the probability distribution of the particle's position is remarkably uniform over most of the length of the box. This distribution function is a weighted average of the squares of the energy eigenfunctions, the weights being given by the Boltzmann distribution. We begin by asking whether one can deduce the Boltzmann weights for this system by insisting that the position distribution function be very flat. Numerical evidence suggests that the answer is yes. We then ask to what extent this observation might generalize to other physical systems.

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