

We consider uniquely ergodic zero entropy systems such as irrational rotations and horocyclic flows. Unique ergodicity says that the Birkhoff sums of nice functions with non-zero mean have the same first-order asymptotic behavior at all initial conditions. But the error term can behave very differently. "Temporal distributional limit theorems" are devices for uncovering and describing the richness of behavior hidden in this term. I will survey what is known about such laws, focusing mainly on the case of irrational rotations. (Joint work with D. Dolgopyat)