

Now, note: Bohm develops fact that

$$\frac{P}{\lambda_P} = \frac{(\Delta p)^2}{2m} t \quad \text{for linear correlation (Pg 203)}$$

Use Liouville's theorem to show that

(at least classically) the information in the joint distribution is invariant with time!

i.e. since in natural motion of phase space into itself the measure of any set is preserved we see that I is invariant. (ie consider ~~over the~~ sets over which probability density is uniform.

Then $I = -\ln(\text{measure of the set})$ and is invariant. Generalizing, any distribution can be thought of as approximated by large no of sets with uniform distributions within them. The partial integrals of $P \ln P$ over these sets will then remain the same through time, and I is invariant. Finally, since the sets are chosen disjointly originally, they remain disjoint so no overlapping. QED

So, I_{total} (position and momentum of all particles)

is invariant. Moreover, I (any single part position or momentum)

↓ then necessarily implies compensately ↑ for some correlations /

Next check over analogue of
Liavilles Thm, for P.M. (density
matrix etc)
and attempts to show likewise
is case for position mom of Quantum Particles

This then changes the Second Law

Due to fantastic complexity of
classical level systems no actual
measurement can be followed exactly
(wave mechanically) hence some
combinatorial theorems are necessary for
rigorous discussion of measuring processes