Solving the Vlasov-Maxwell equations

Two options:

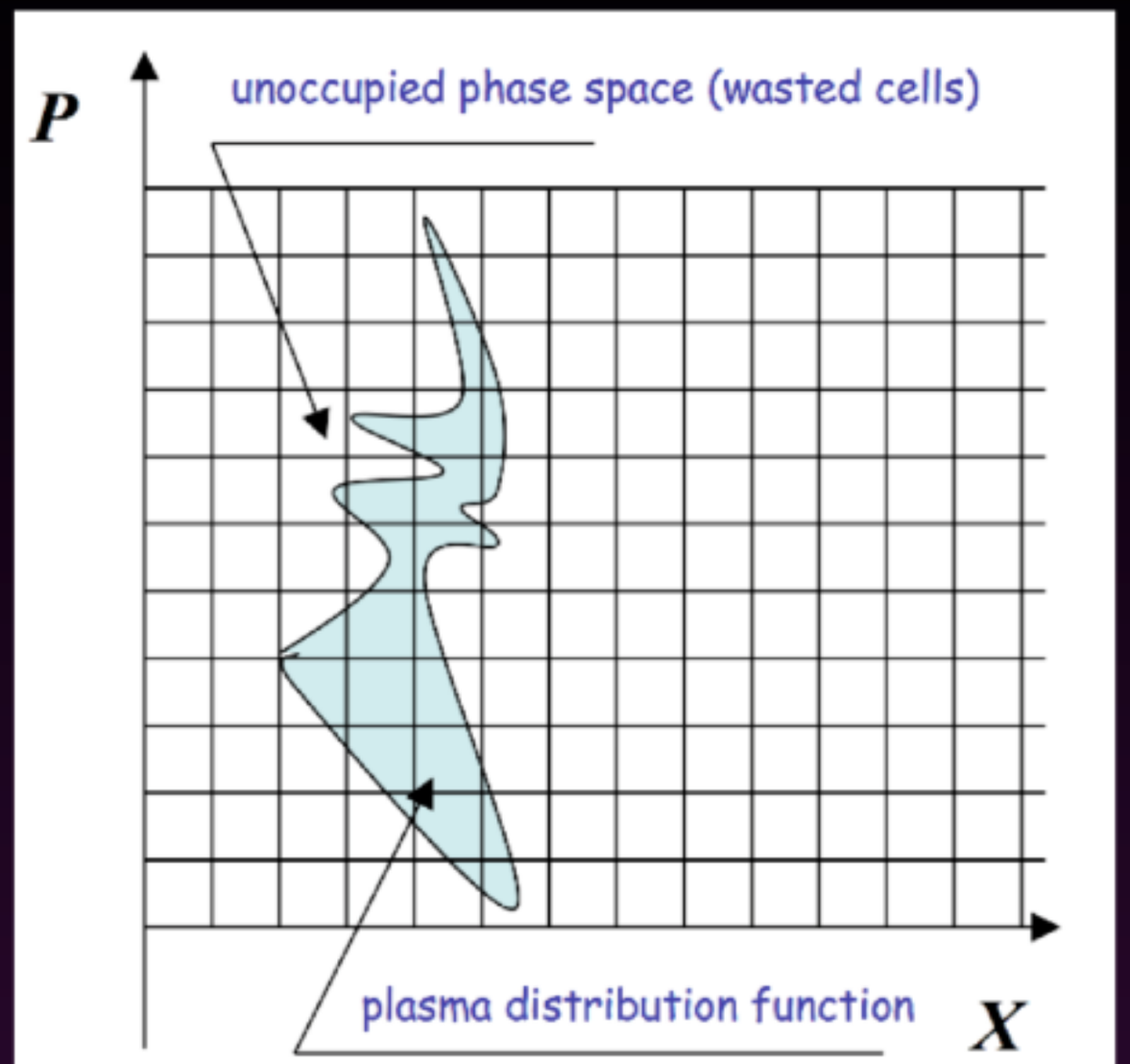
• Discretize the Vlasov equation on a grid in phase space:

1. computationally expensive to solve in 6+1 dimensions

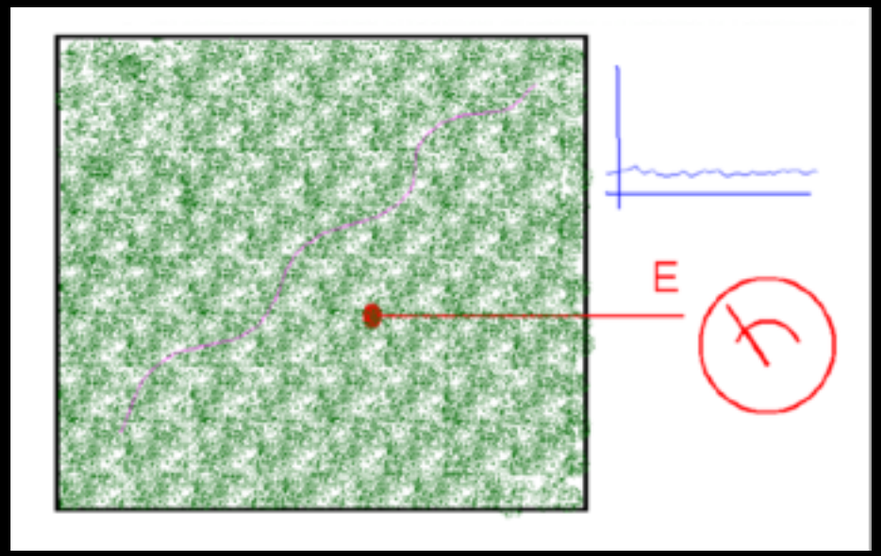
2. how to determine the boundaries of the grid in momentum space?

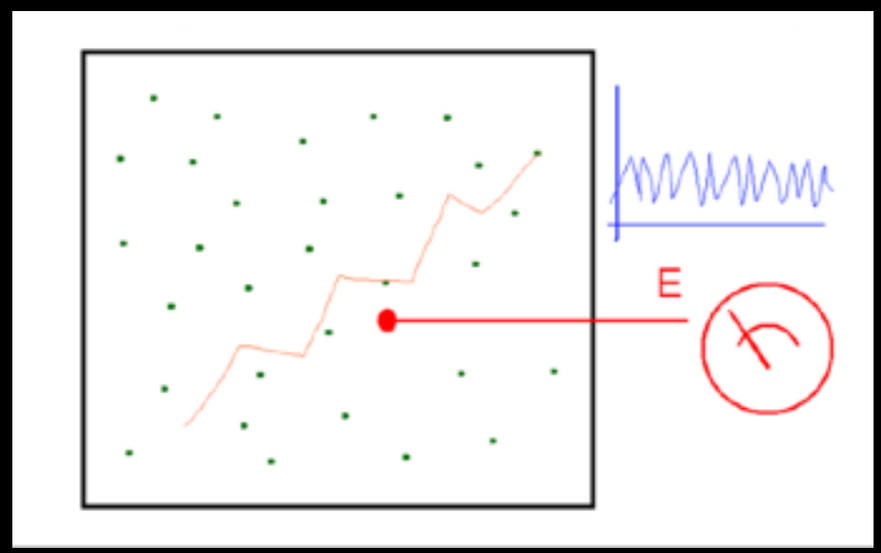
3. what if $f<0$?

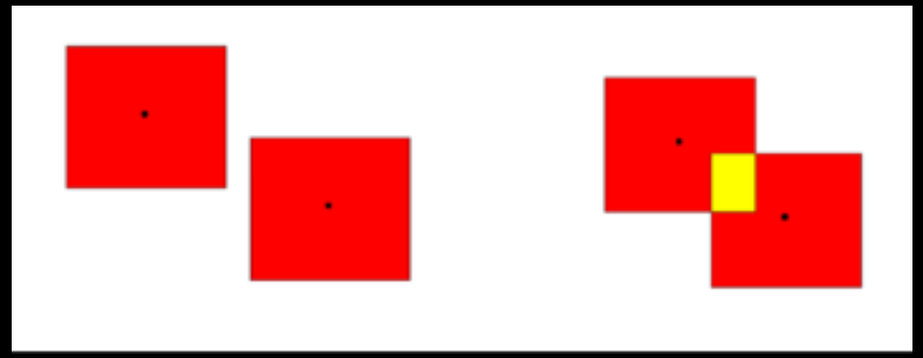
• Sample the phase space density with particles, and follow them as LAGRANGIAN tracers.



Macro-particles vs. real particles







$$\Lambda = \frac{E_{th}}{E_{pot}} = \frac{4\pi\epsilon_0 akT}{q^2}$$