PUPPI

for a particle *i* with nearby particles *j*

[1] define a local metric, α, that differs between pileup (PU) and leading vertex (LV)

[2] using tracking information (e.g. charged particles) “sample” the event, define unique distributions of α for PU and LV

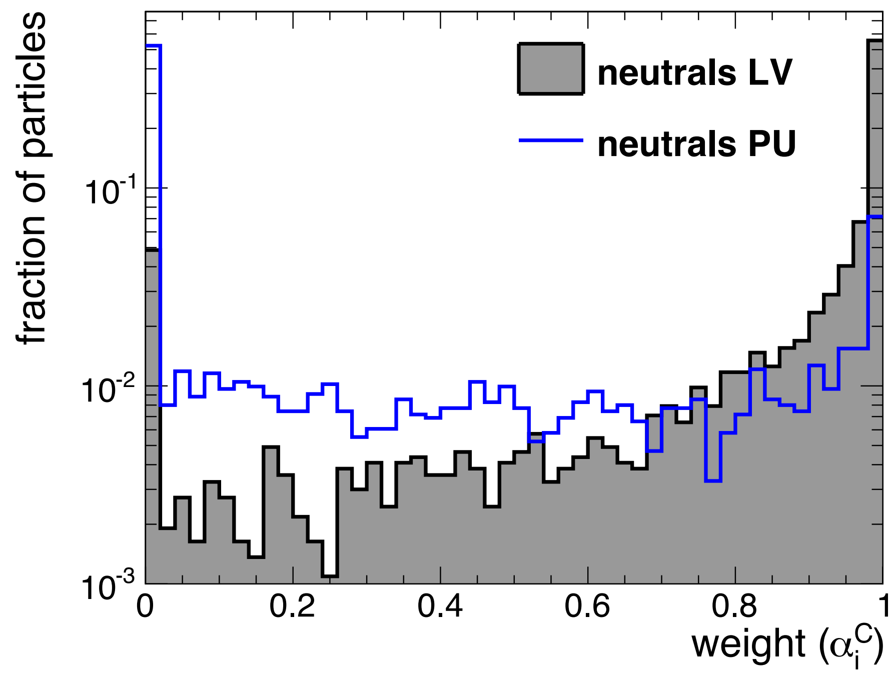
[3] for the neutrals, ask “how PU-like is α for this particle?”, compute a weight for how un-PU-like (or LV-like) it is

[4] reweight the four-vector of the particle by this weight, then proceed to cluster the event as usual

example: 2-body system, for a particle **i**, what does particle **j** tell us?

$$\alpha_i^C = \log\left[\sum_{j\in \mathrm{Ch,LV}} \boxed{\frac{p_{T,j}}{\Delta R_{ij}}}\,\Theta(R_0 - \Delta R_{ij})\right]$$

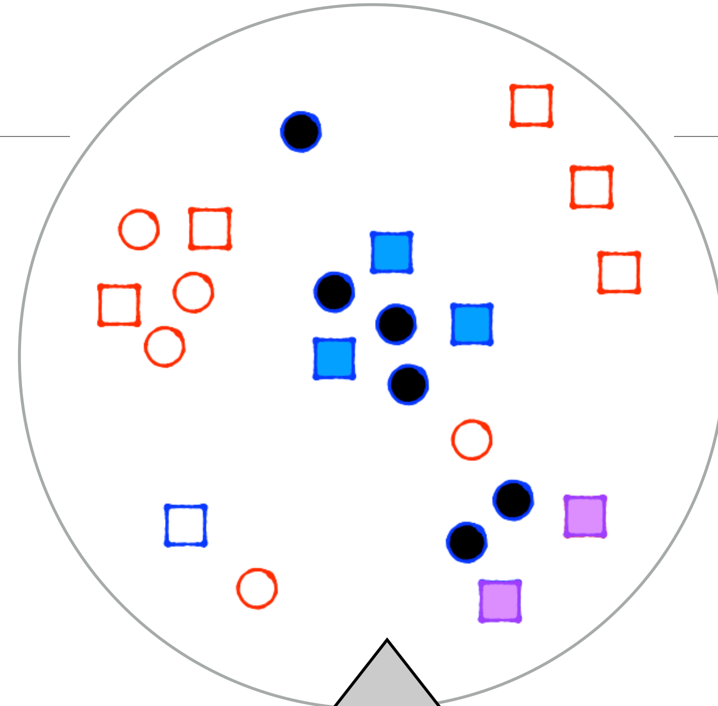
⬆ for harder, collinear particles
⬇ for softer, wide angle particles

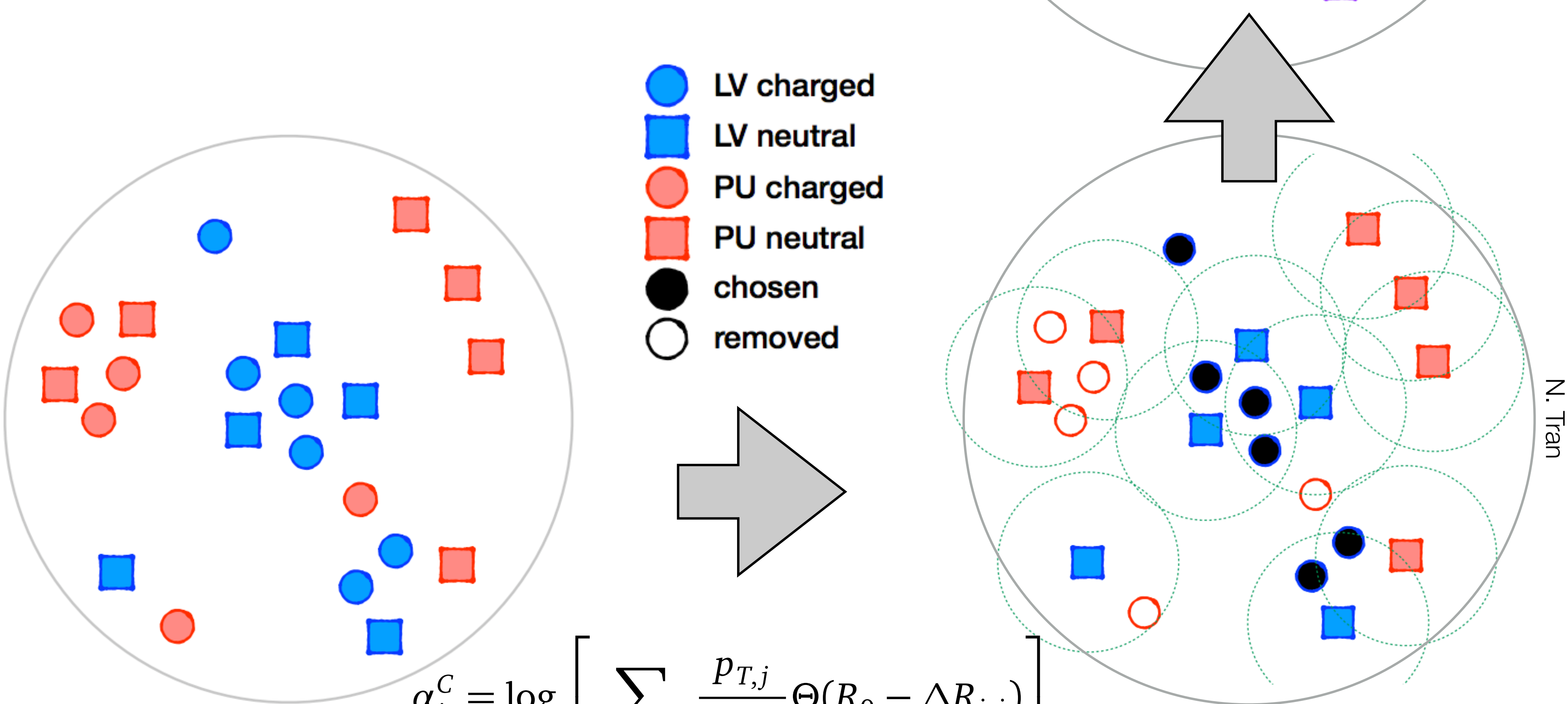


PUPPI arXiv:1407.6013

- Easy to use tracking information to find which particles originated from the primary vertex

- If neutral particles are mostly surrounded by charged particles from pileup activity, they are probably pileup as well

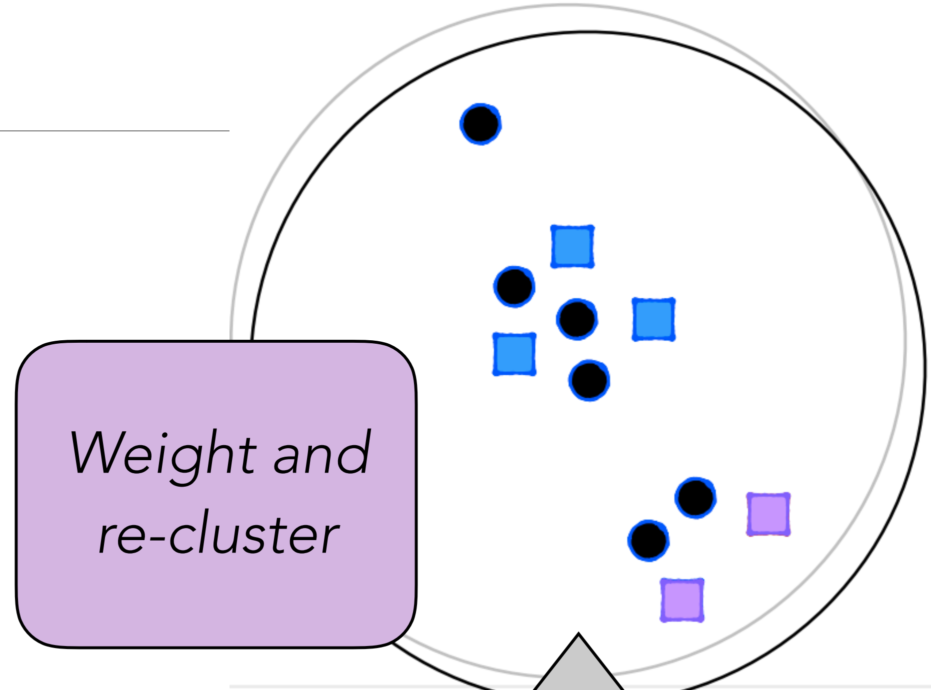


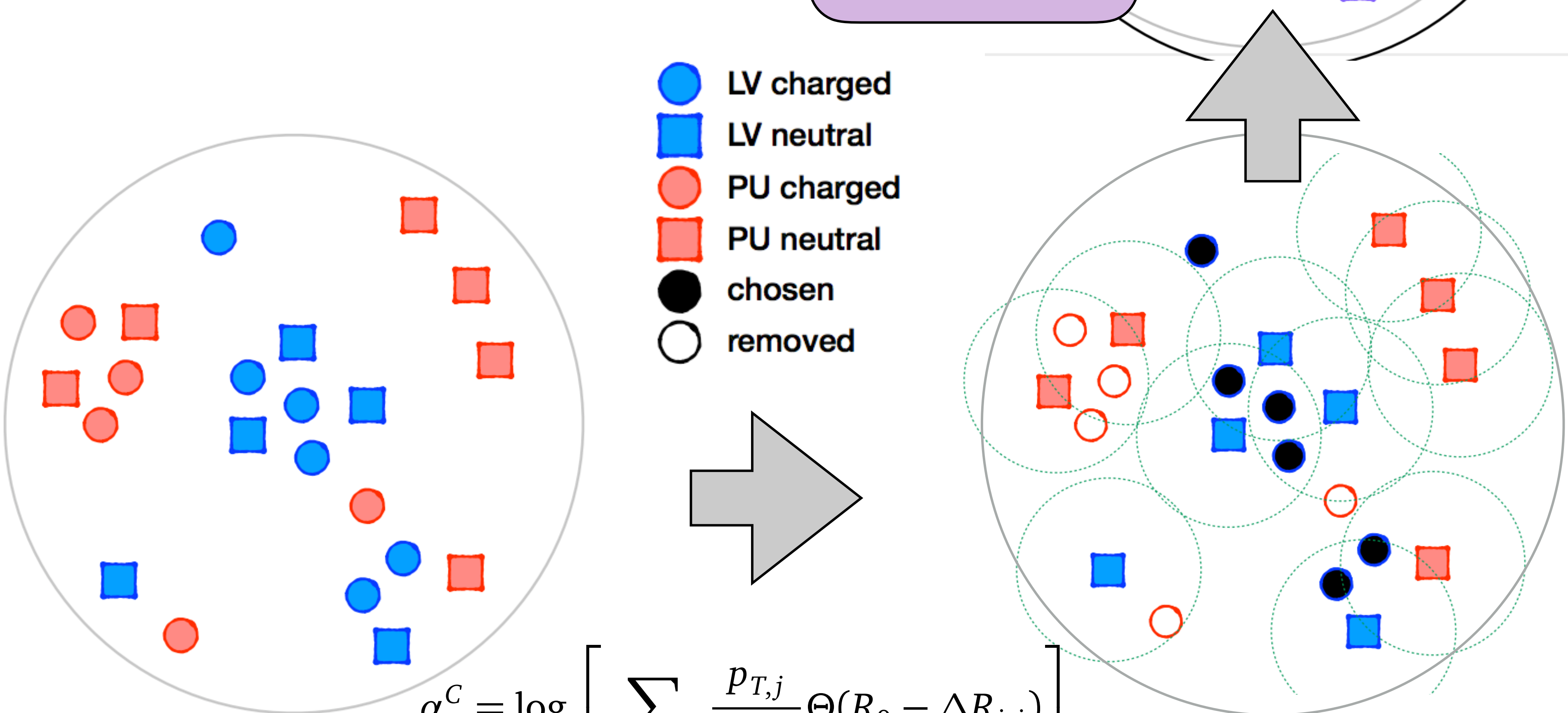


$$\alpha_i^C = \log\left[\sum_{j\in \mathrm{Ch,LV}} \frac{p_{T,j}}{\Delta R_{i,j}} \Theta(R_0 - \Delta R_{i,j})\right]$$

PUPPI arXiv:1407.6013

- Easy to use tracking information to find which particles originated from the primary vertex
- If neutral particles are mostly surrounded by charged particles from pileup activity, they are probably pileup as well





$$\alpha_i^C = \log\left[\sum_{j\in \mathrm{Ch,LV}} \frac{p_{T,j}}{\Delta R_{i,j}}\Theta(R_0 - \Delta R_{i,j})\right]$$

N. Tran