ProtoDUNE PDS Run Plan Ideas/Proposals

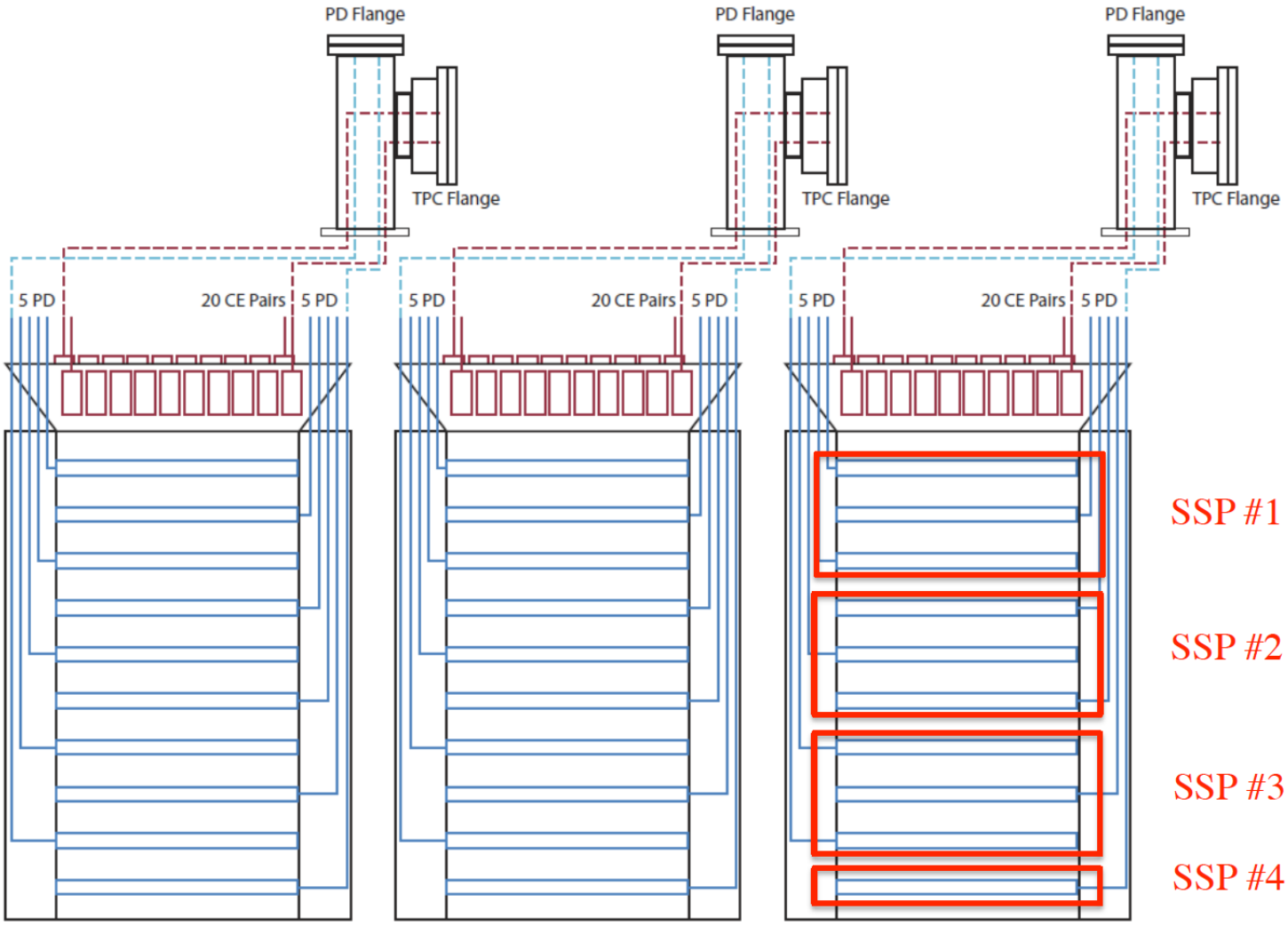
1) Measure/scan the light yield as a function of high-voltage
   -Confirm light yield expected for given E-field, purity
   -Is it related to MicroBooNE anomaly? Could it be space-charge? Because of volume recombination of electron and ions might produce light
   -Do this with cosmic-ray muons in controllable (reproducible) setup, ideally with CRT so the same muons are sampled repeatedly. Do this as a f(HV).
   -Make sure PDS response did not change with HV change: to test stability , run DCM with a sufficient statistics at each HV value

2) New/additional DCM scans
   -Get more statistic for PDS channels away from diffusers (effect ~ $1/R^2$) to improve channel gain calibration
   -Observe any changes wrt to original calibration?
   -Test Aging? Keep repeating weekly?

3) Timing Studies
   -We are trying to understand time delays wrt global Timing System (+ CRT, CTB)
   -If timing system changes (upgrades planned), we might need to take the data right after the change to test our understanding of how it compares to other systems

4) Michel Electrons
   -Can we optimize PDS for these events? (see older talk slides)

Planned Readout Scheme



Form multiplicity condition within each SSP?

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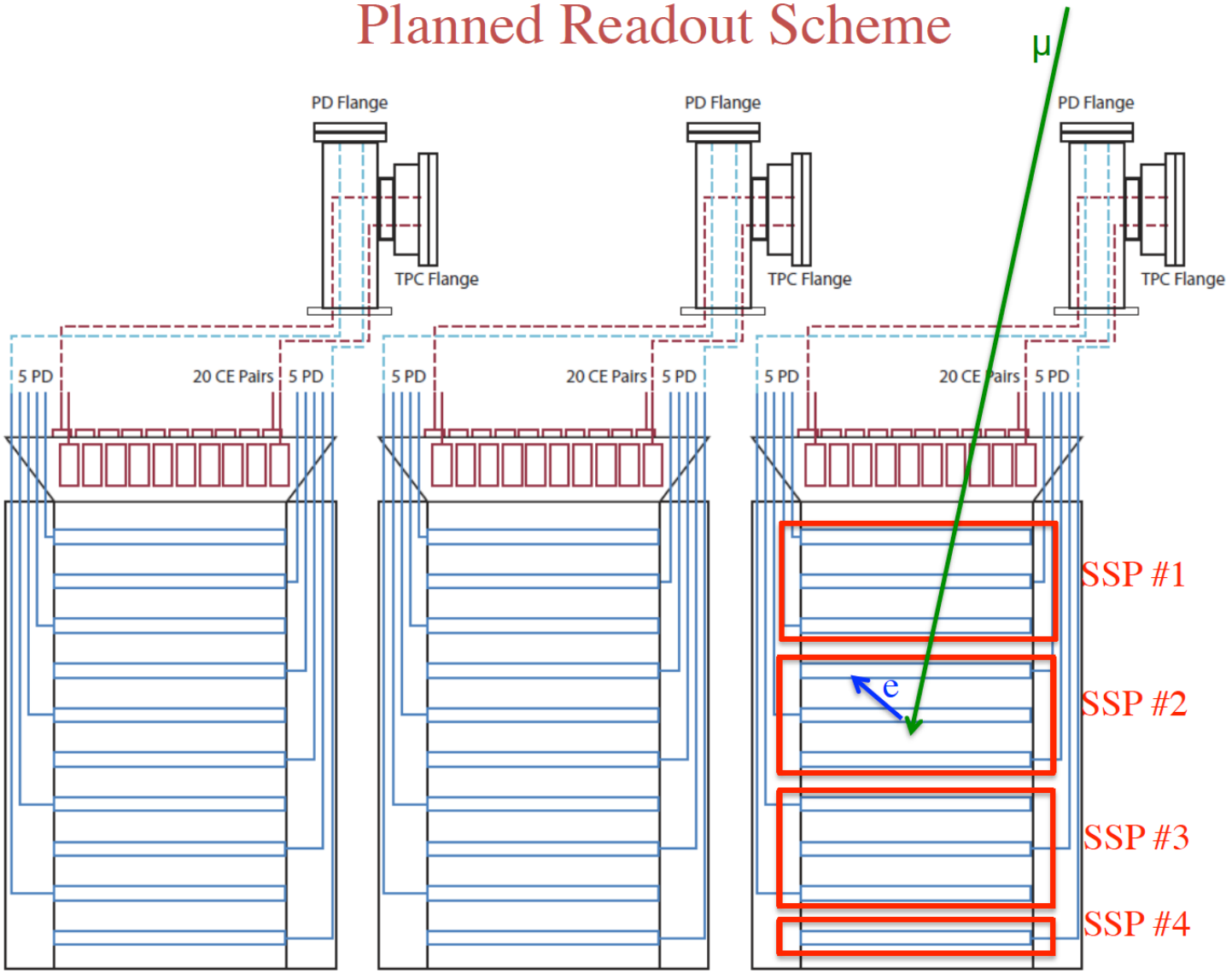

Form multiplicity condition within each SSP?

Optimize to look for μ + e (Michel Electrons)?

Enable "pile-up" modes for special muon runs?