

Single processing check in PDVD

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Pochoir

https://github.com/brettviren/pochoir/tree/confings_and_instructions

Domain:

In general define the shape of arrays and spacing;
the array can be values of boundary, voltage,
potential, velocity...

3D drift field



drift velocity;
electron drift path



2D weighting field
3D weighting field
separate for u v
and w planes

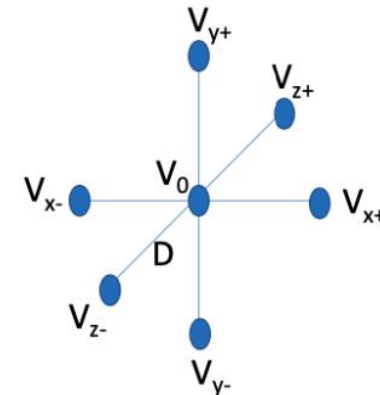


final result:
induced current

Solve 1st Maxwell equation on a 3D
lattice both for the drift field
and the weighting field using Finite
Difference Method (FDM)

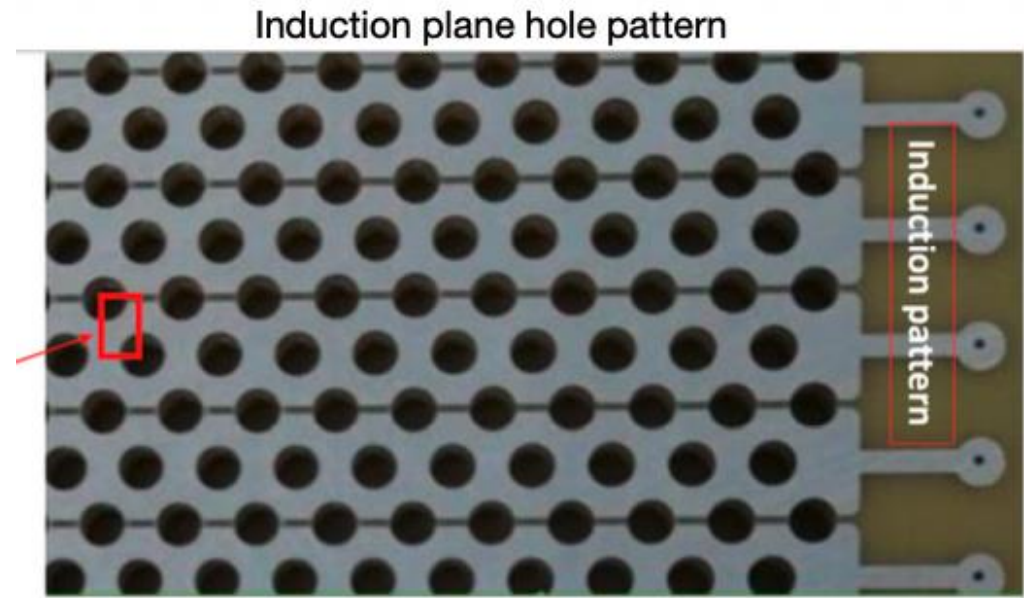
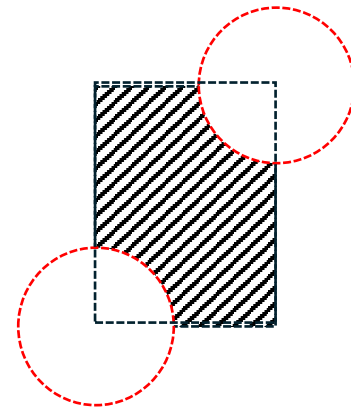
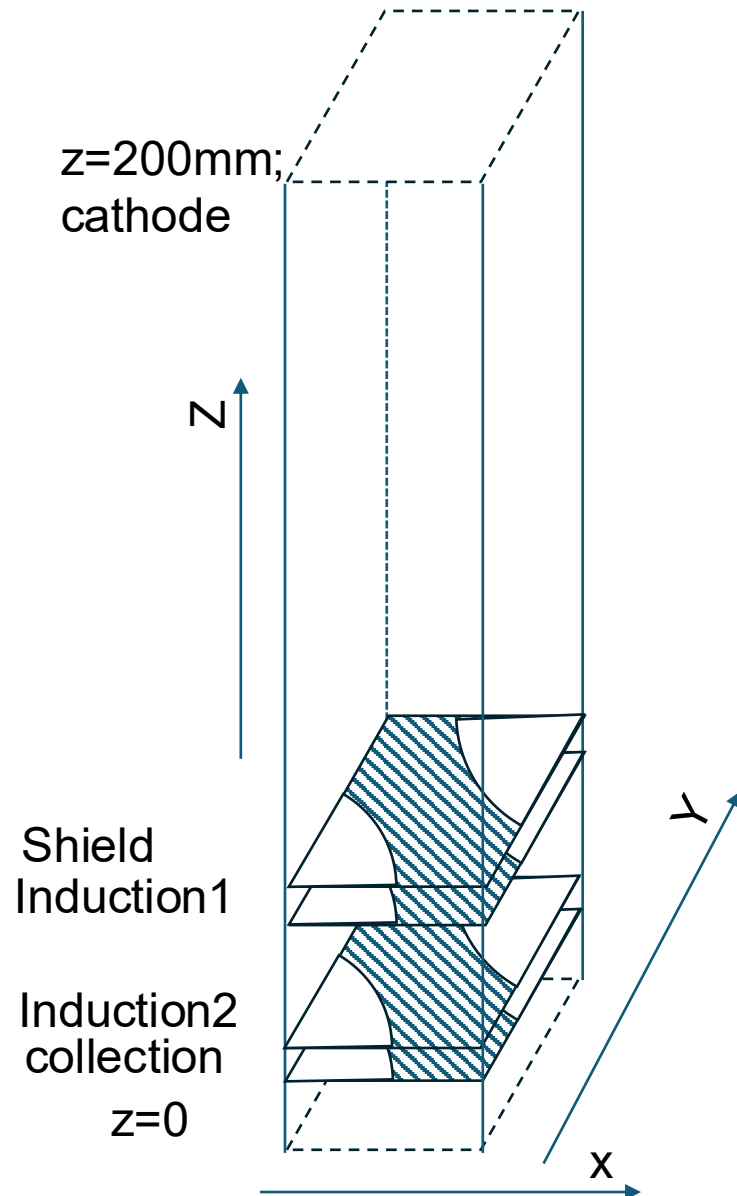
Iteratively solved for
whole simulated
volume

$$V_0 = \frac{(V_{x+} + V_{x-} + V_{y+} + V_{y-} + V_{z+} + V_{z-})}{6}$$

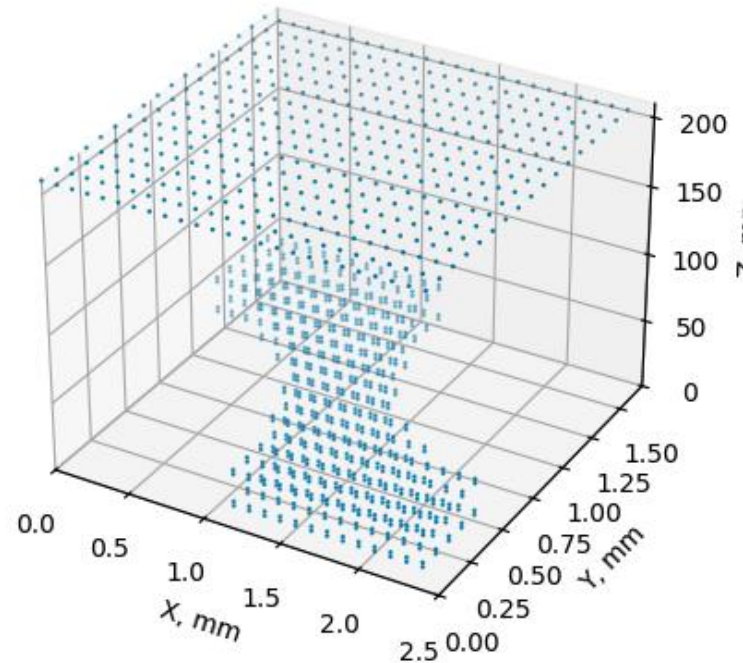


3D Drift field

Minimal symmetry for Drift Field



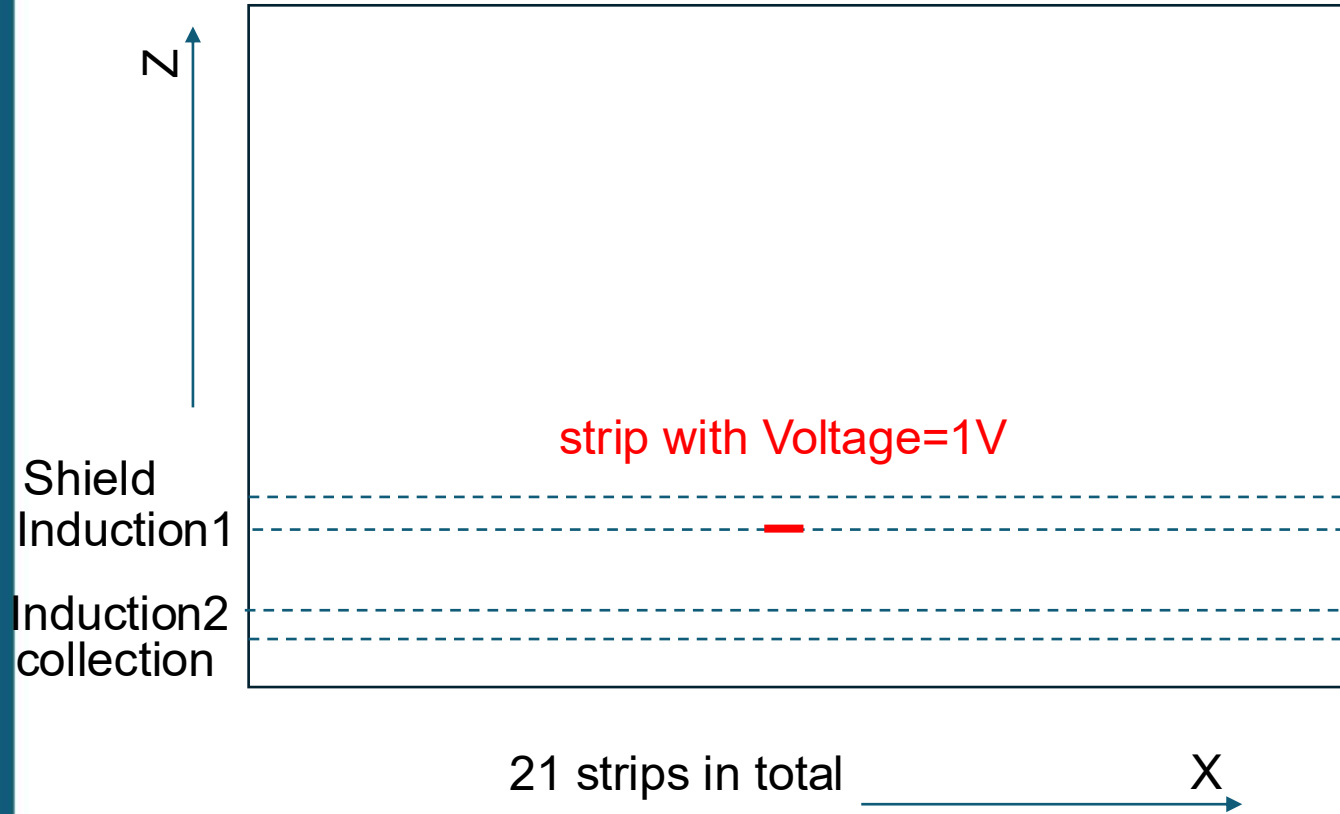
PCB Quarter 30deg - Boundary



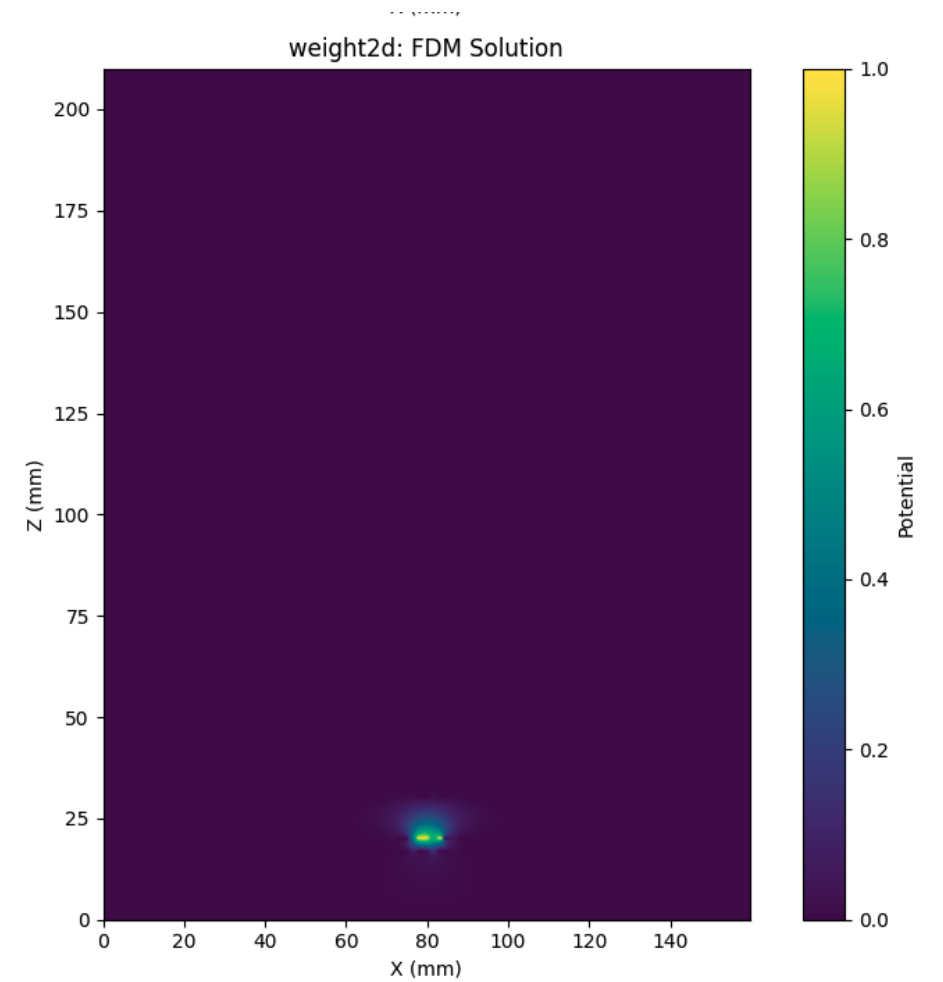
2 arrays to describe:
one for boundary;
one for voltage.

Then solved by FDM.

2D weighting field

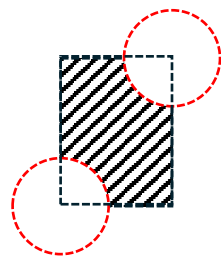


⊗, strip direction

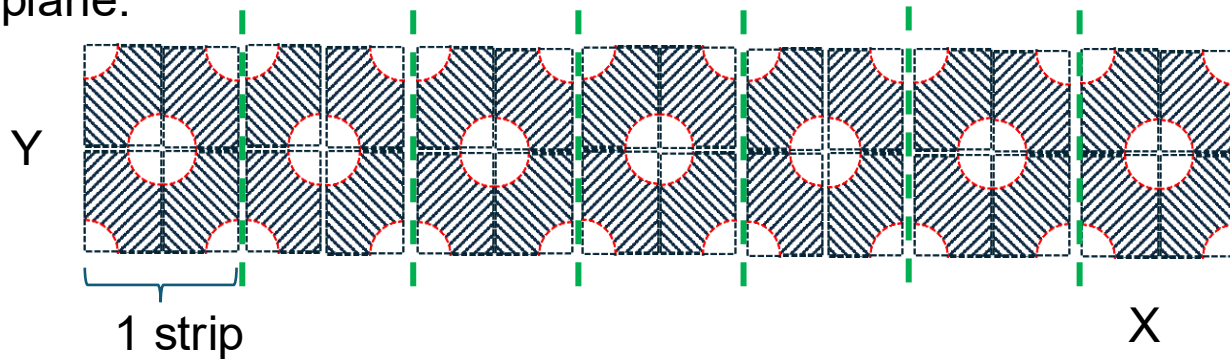


3D weighting field

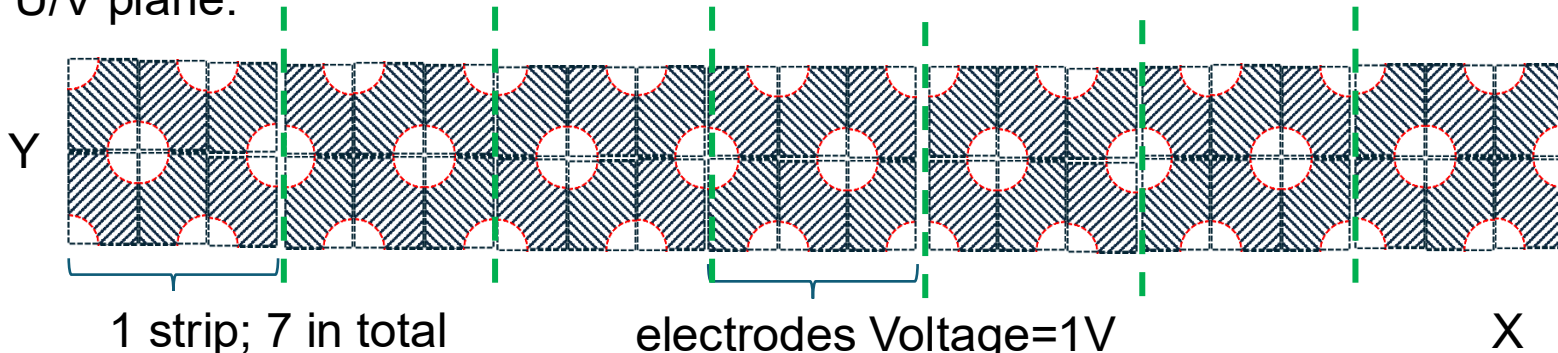
⊗, strip direction



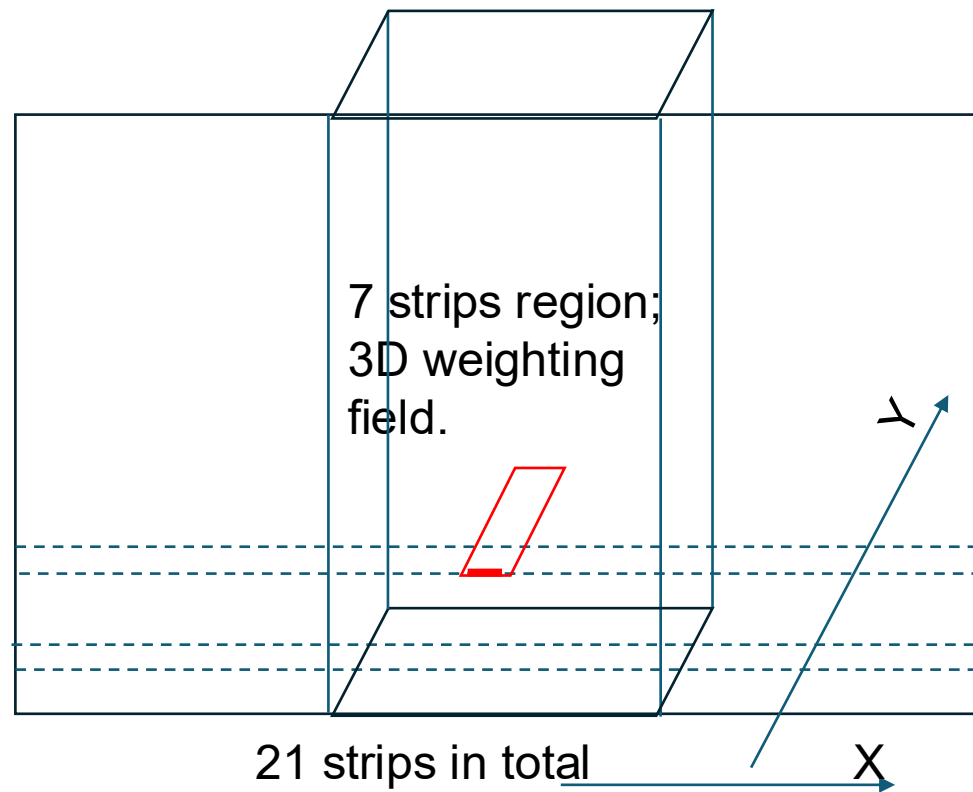
W plane:



U/V plane:

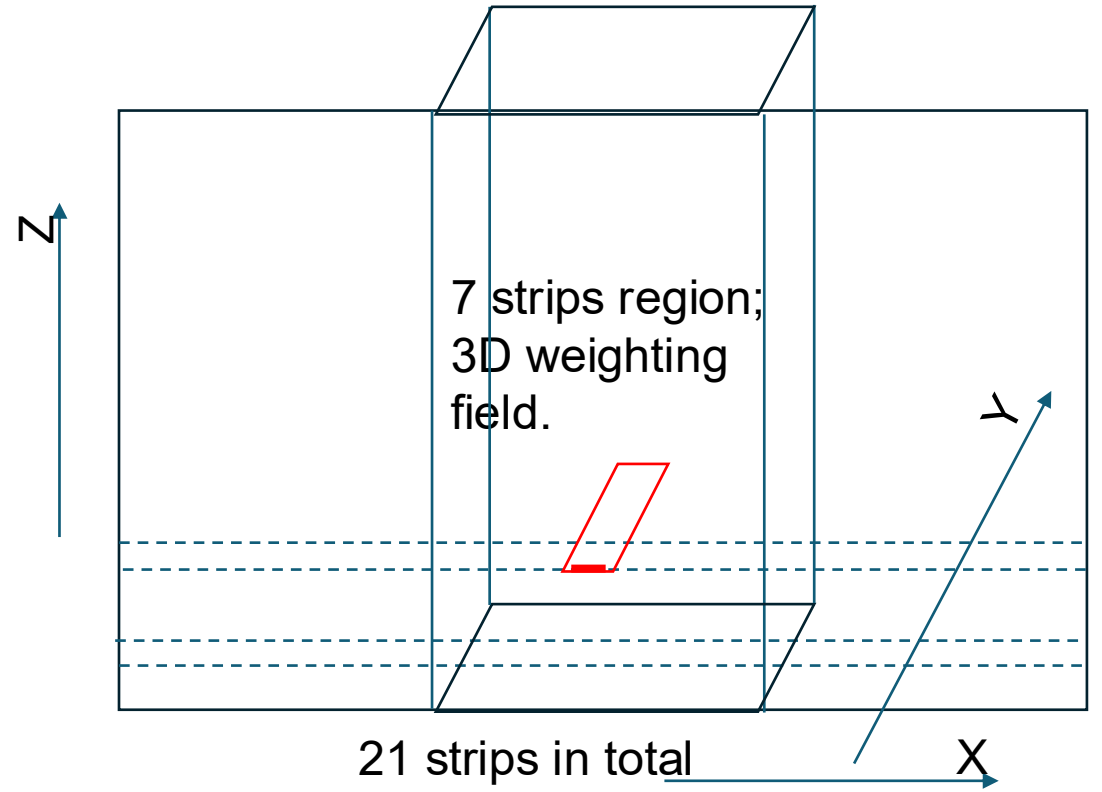


Z

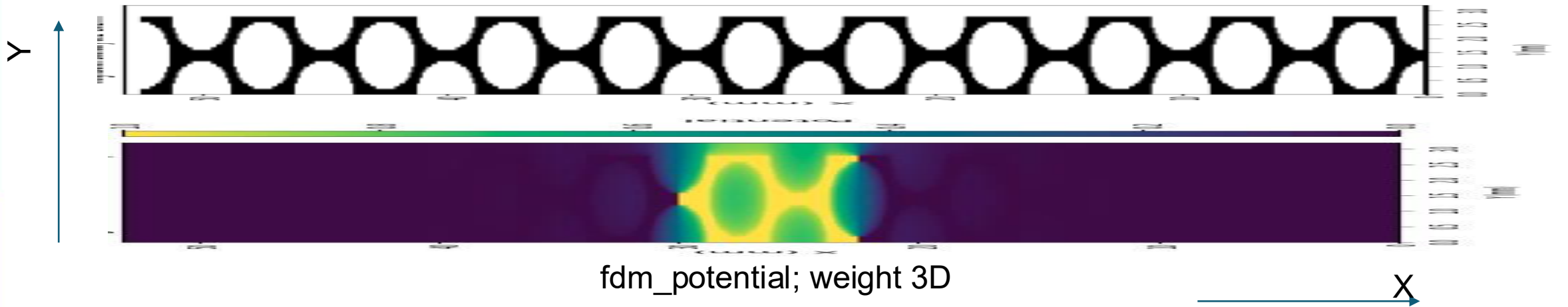


3D weighting field

initial value on boundary is got from
2D weighting field solution.

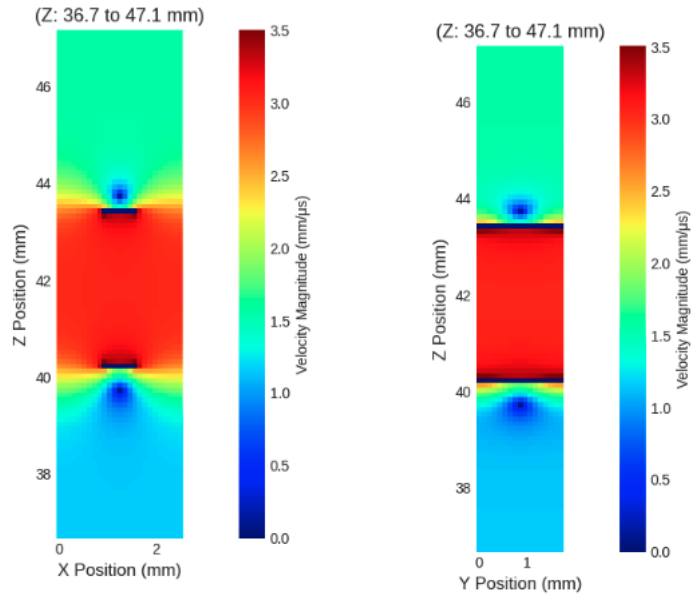


boundary



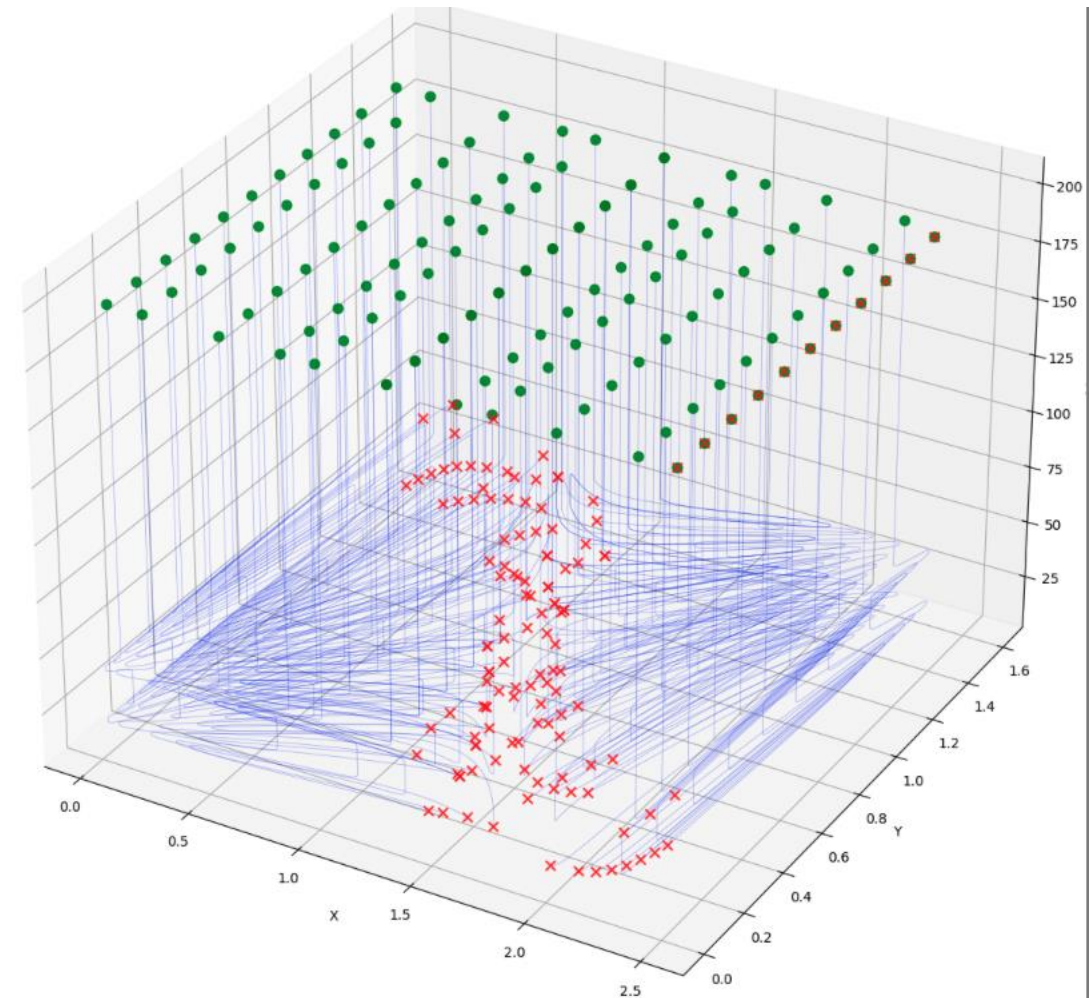
Velocity, starting points and drift paths

velocity distribution

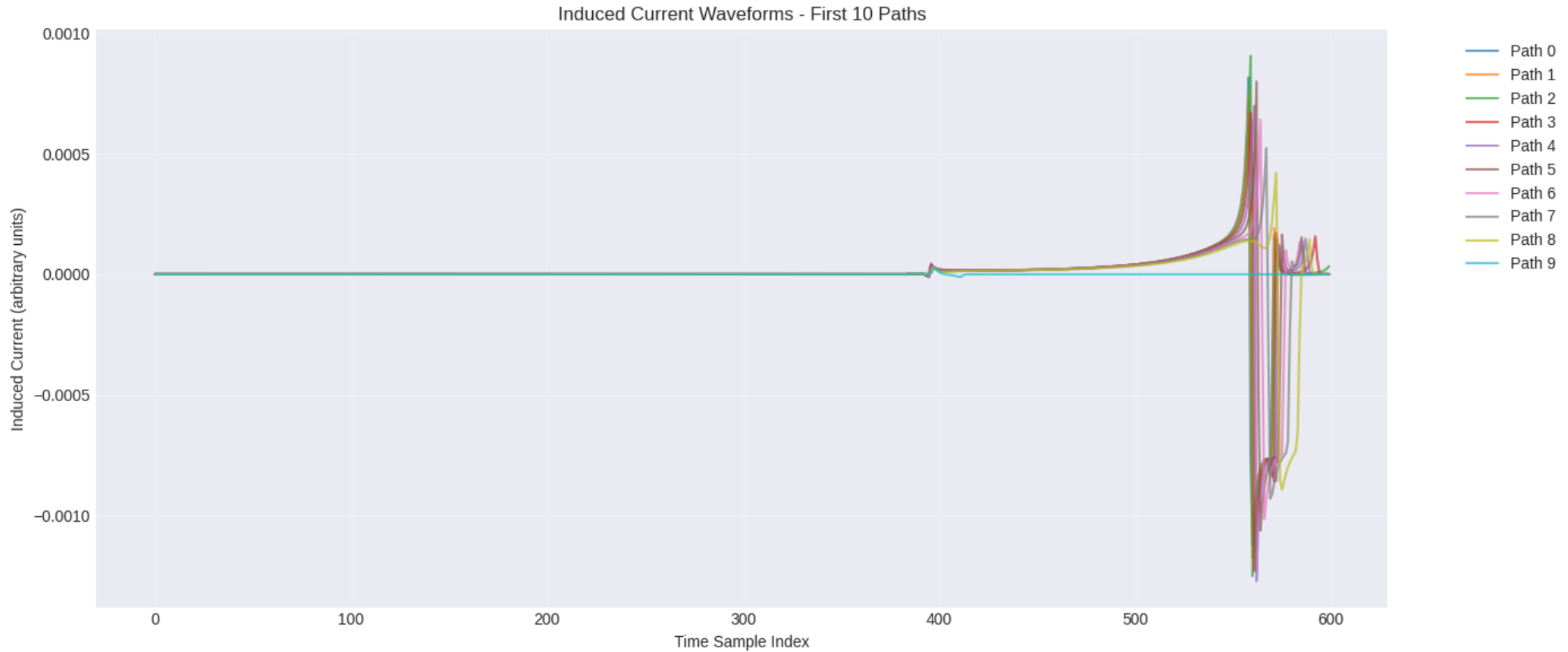


Drift Velocity Magnitude:
|v| range: [0.0000, 3.5935] mm/μs
|v| mean: 1.4554 mm/μs

electron drift paths

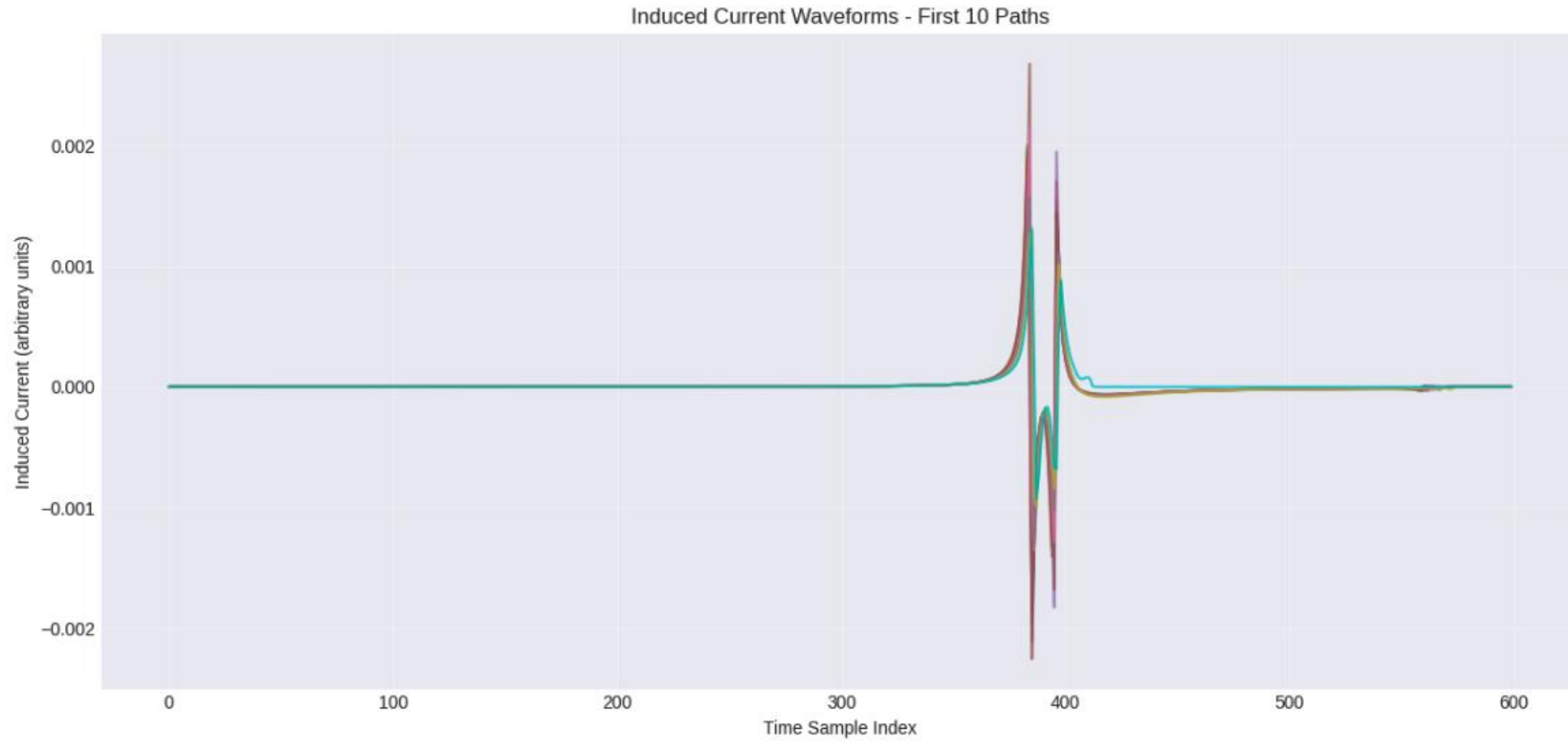


Induced current on u



Induced current calculated using Ramo's theorem $i = -e \times \vec{v} \times \vec{E}_w$

induced current on v



This is weird...I am still checking