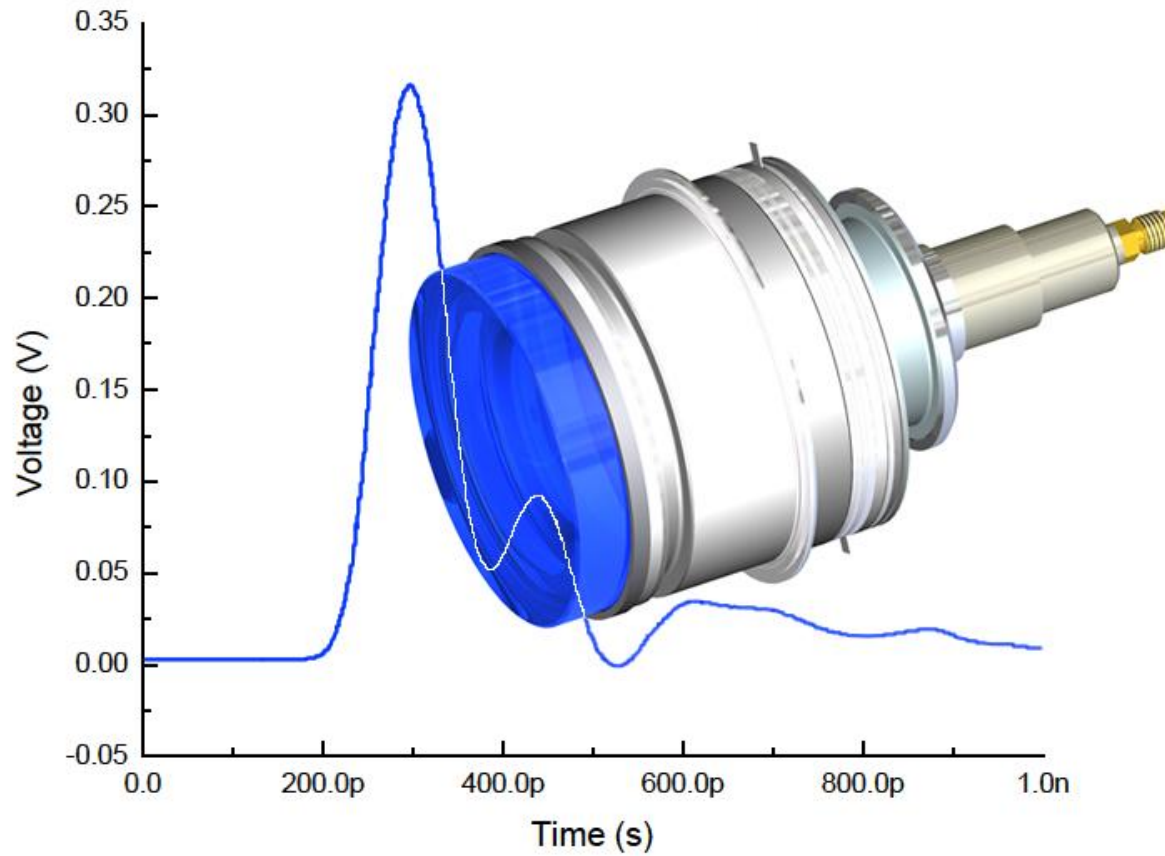


Recent Experiments and Modelling of Diamond Dynodes

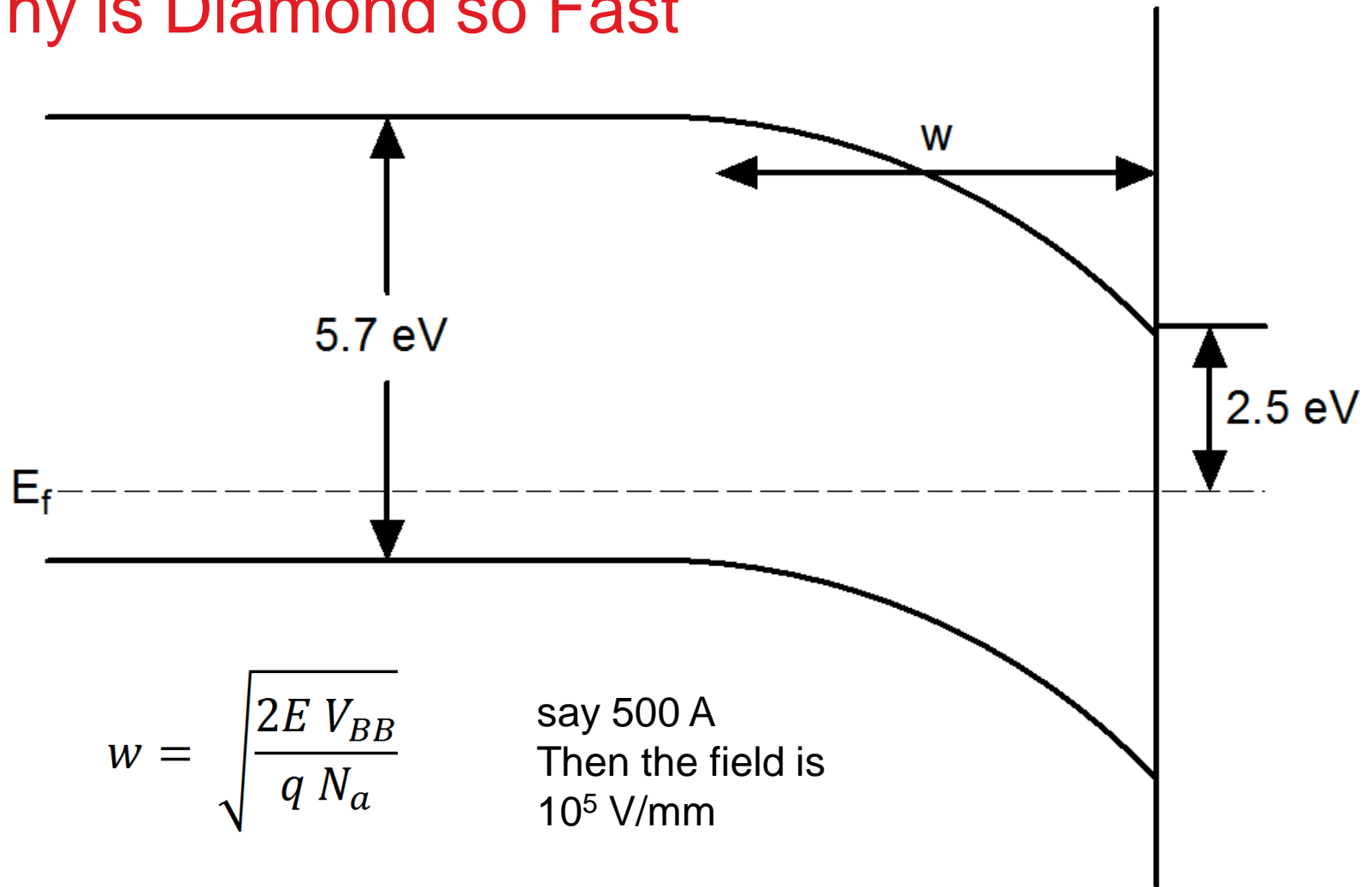
Jon Howorth

Misha Monastyrski

Time Resolution



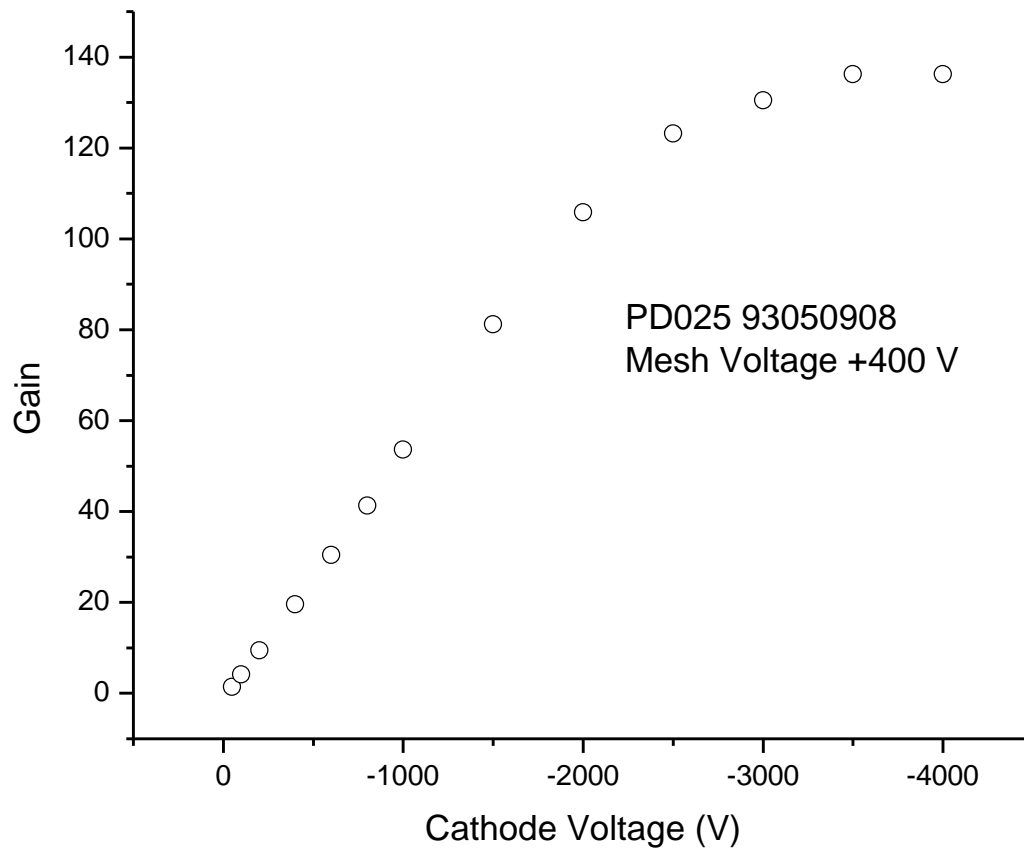
Why is Diamond so Fast



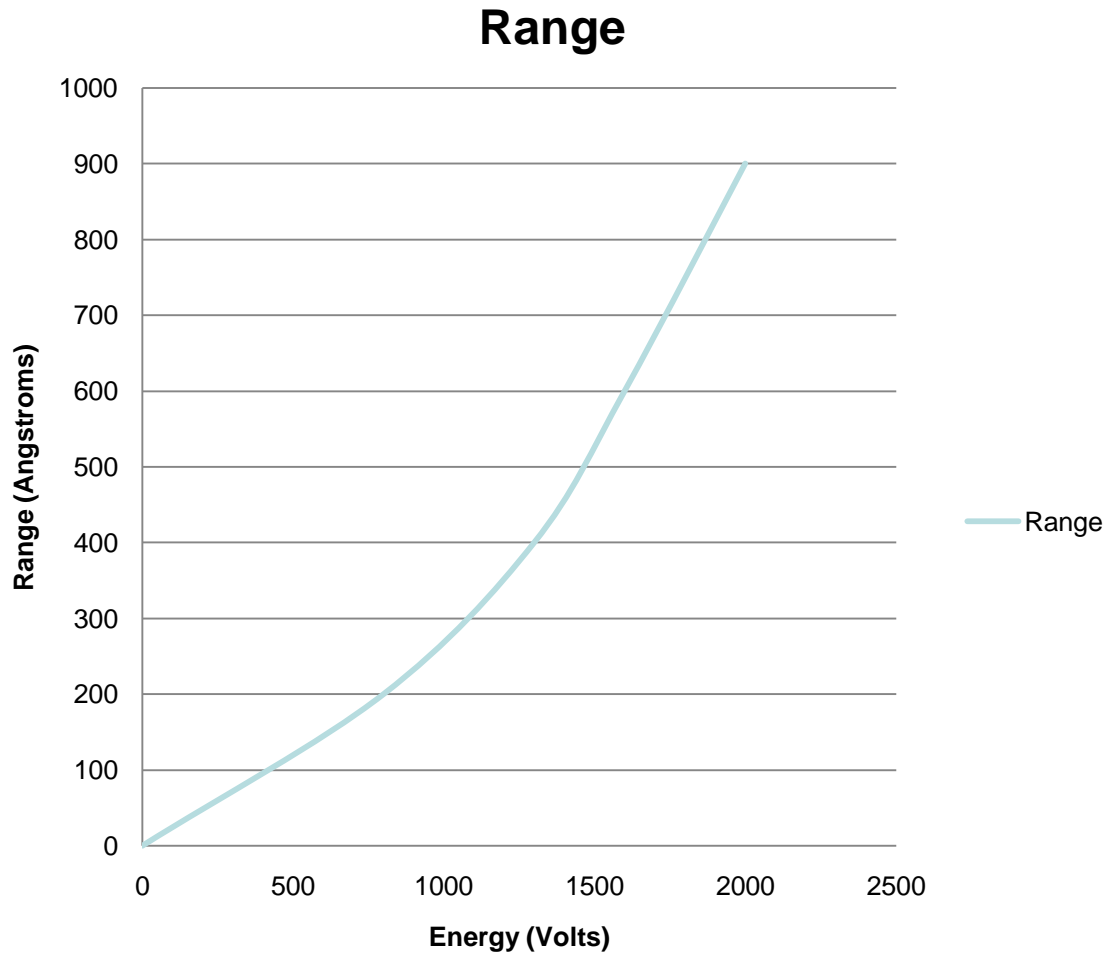
$$W = \sqrt{\frac{2E V_{BB}}{q N_a}}$$

say 500 A
Then the field is
 10^5 V/mm

Gain



Electron Range in Diamond



Metal Venetian Blind Dynode

TESA-REFLEX Vista 2.2.0 , TESA (C) X-Y: 2D- Z: 1D OM: 4.00X (4X*1.00X)

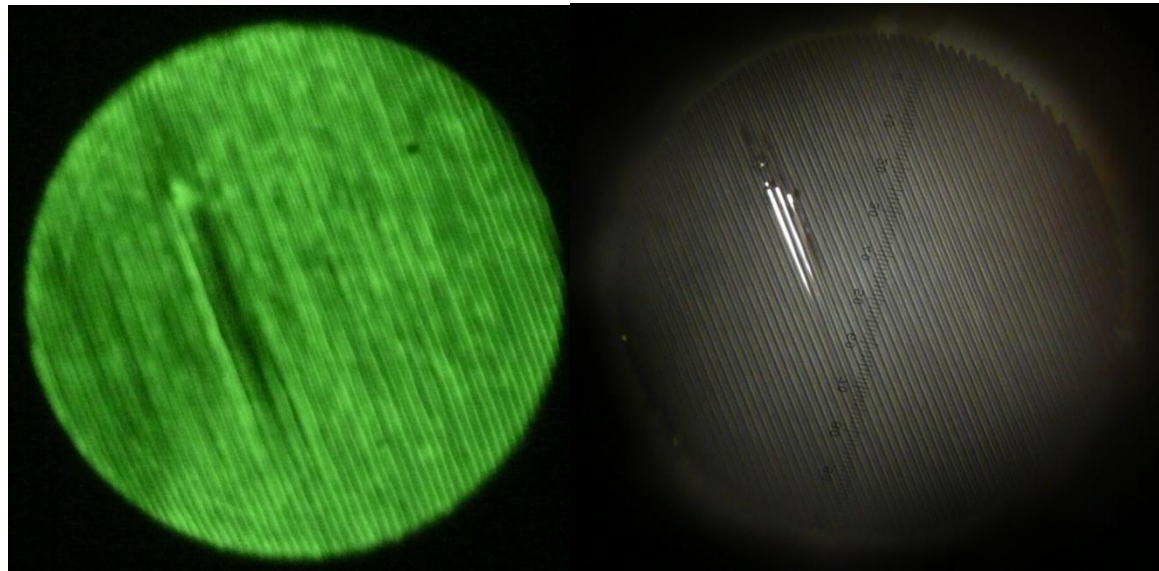


X	0.0885
Y	-0.0468
Z	-0.0967

Feature	Actual
X:	0.0713
Y:	-0.0404
Z:	-0.0587

163.1X
DEG
MM
16.3.2011 15:48

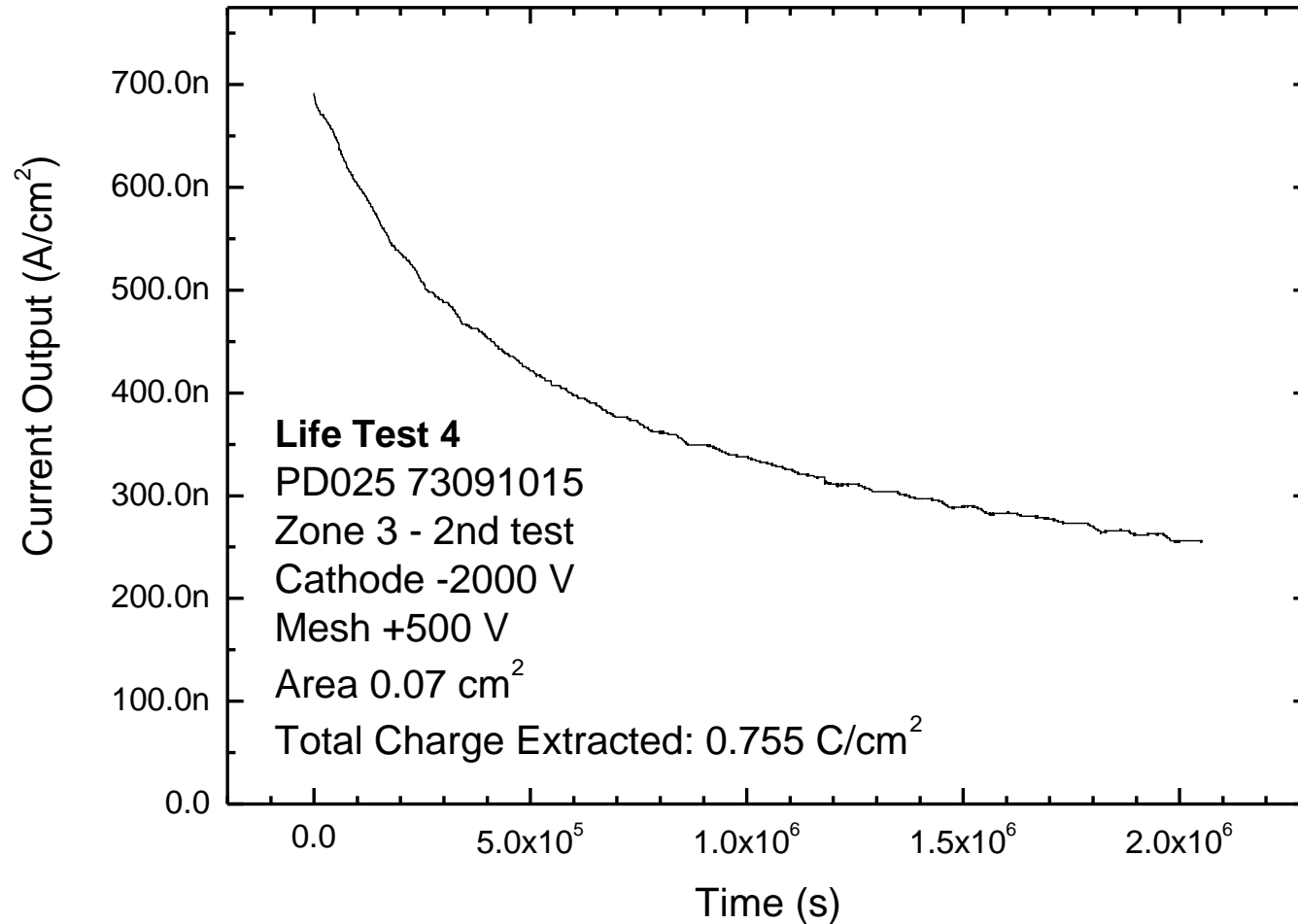
Assessment of Slit Dynode in Transmission Mode



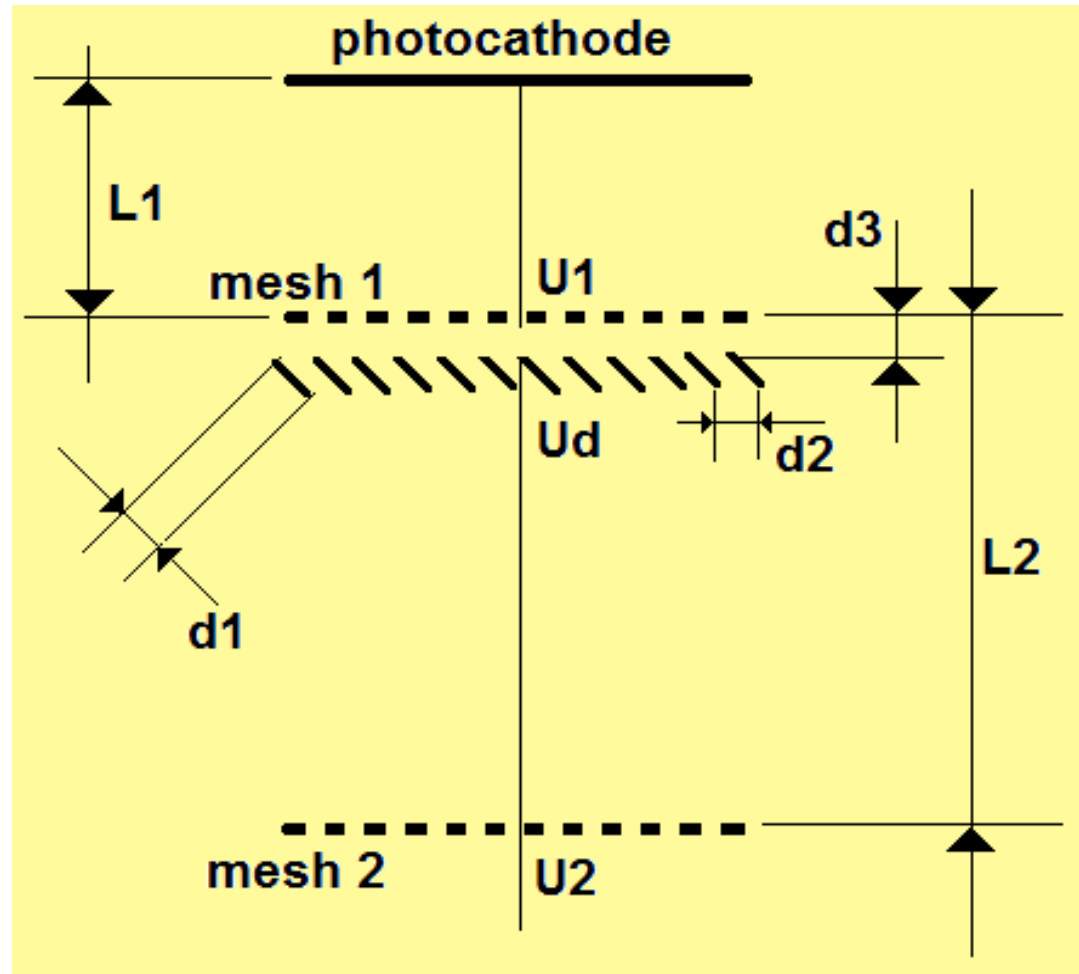
Left image:
MCP IN: 0 V
MCP OUT: 650 V
Dynode pair & mesh: 1150 V
Phosphor screen: 5650 V

Right image:
Back-lit photo of dynode pair

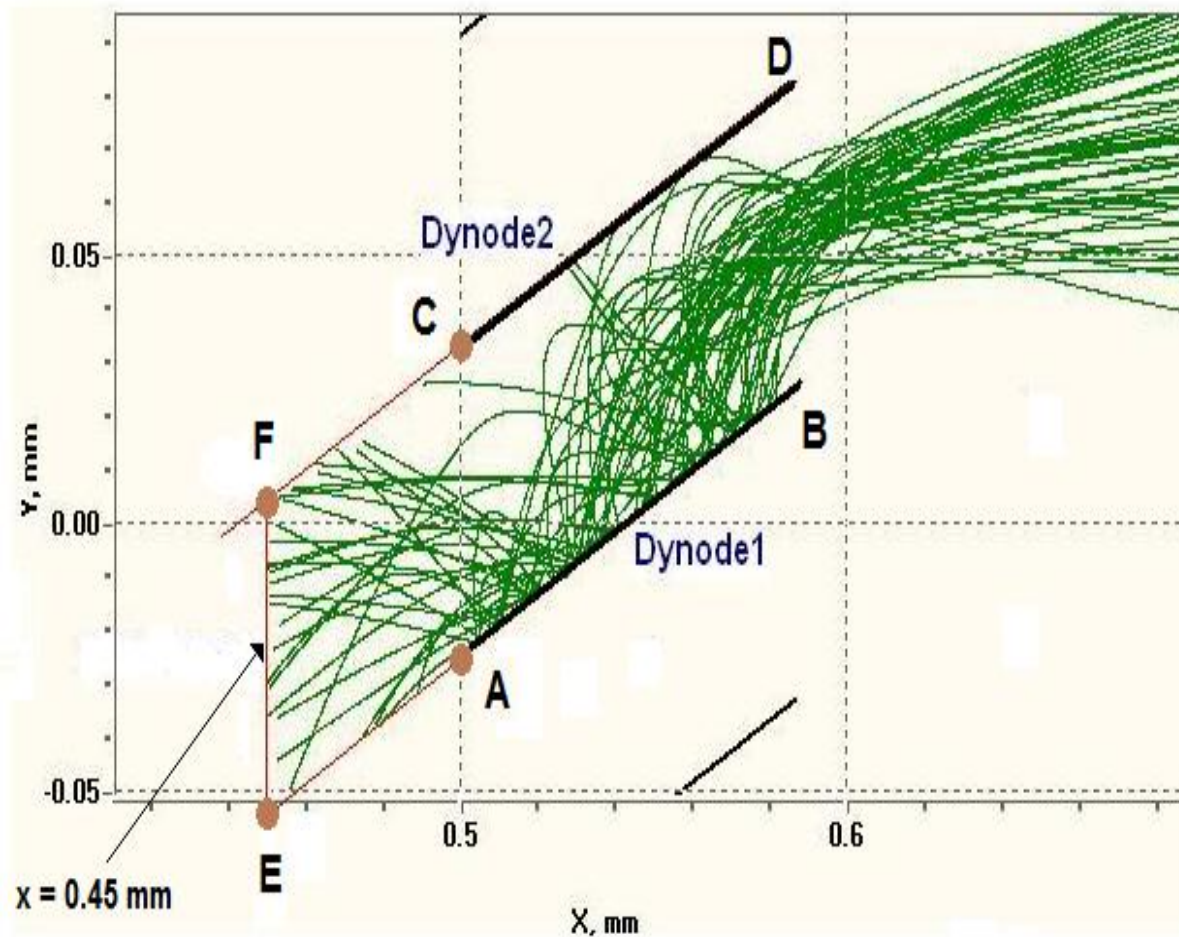
Life Test



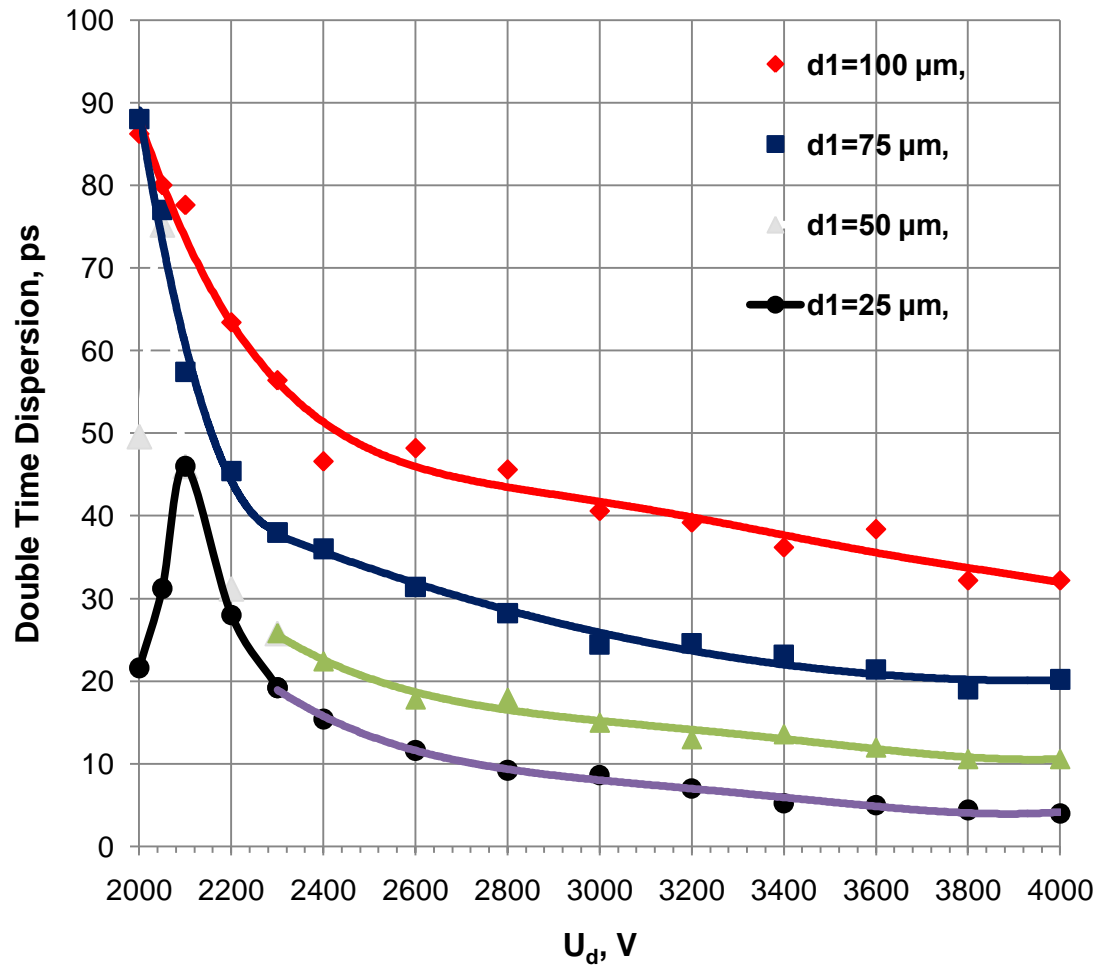
Model of Venetian Blind Dynode



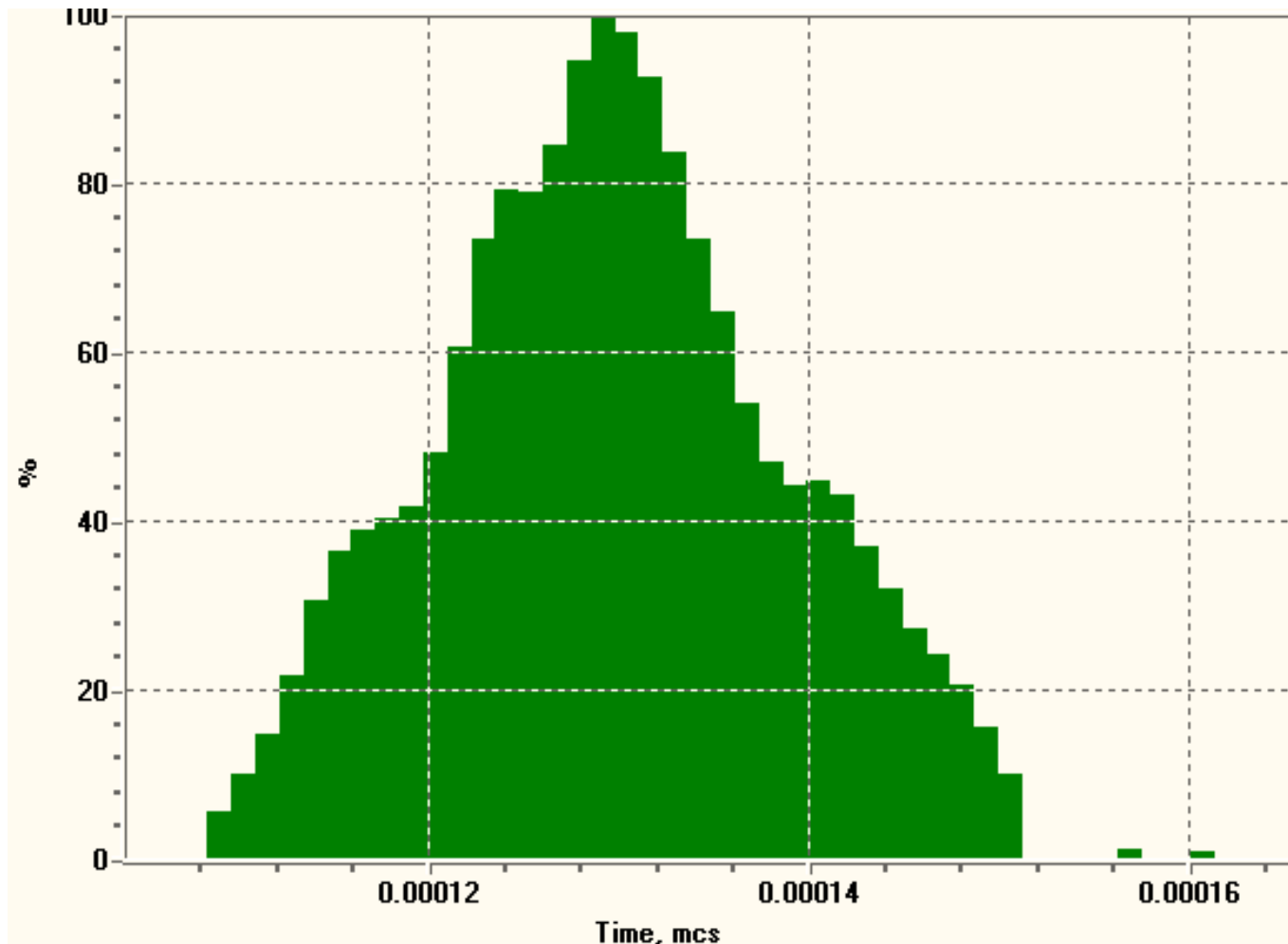
Electron Trajectories



Transit Time Spread as a Function of Mesh-Dynode Volts



TTS for a Single Stage at 800 V/mm



Summary

- No photocathode degradation
- Response time of diamond is fast because of band structure
- Venetian blind can achieve 20ps/stage at 50 micron scale
- Count rate of venetian blind is linear to very high rates

Thank you for listening

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