

Processing of Endpoint Information from HAR Vias

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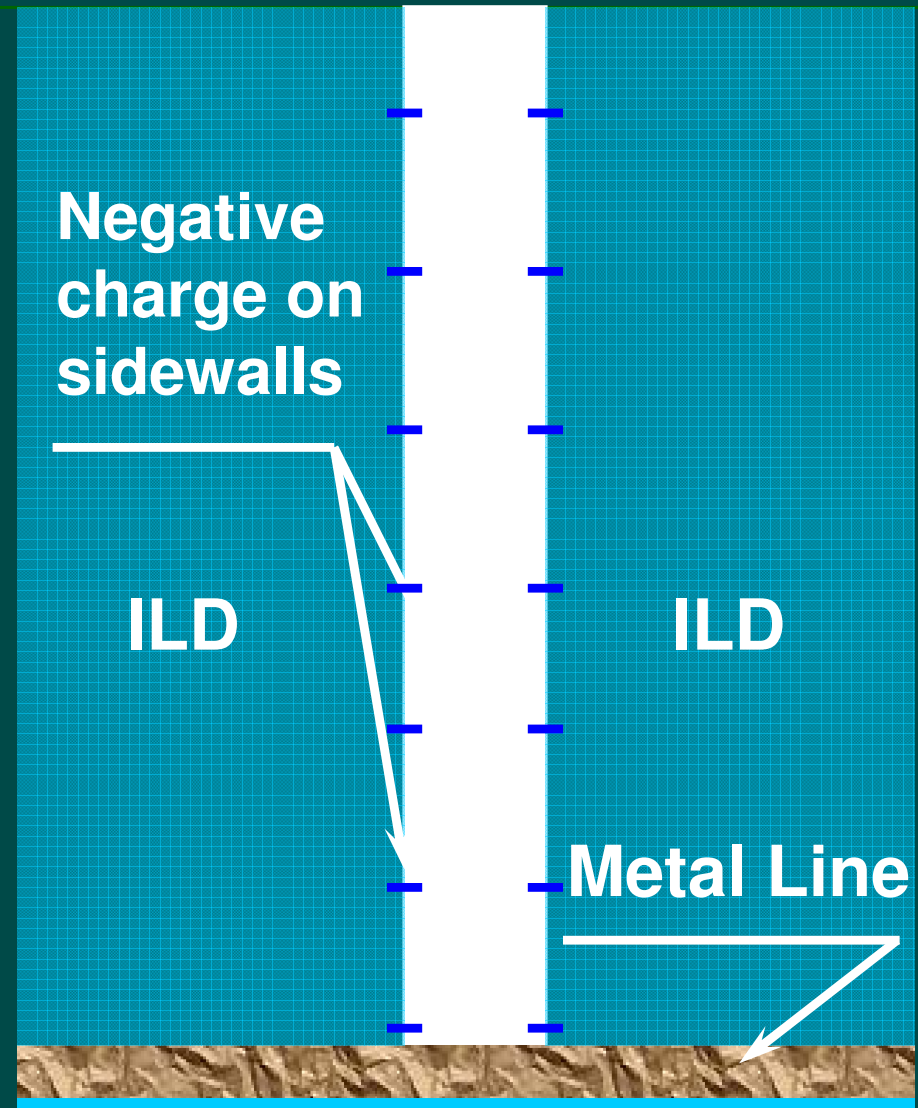
Outline

- ◆ **Mechanism of HAR Endpoint Detection**
- ◆ **Distribution of Endpoint Information**
- ◆ **Example of Spatial Filtering**
- ◆ **Summary**

HAR Endpoint Mechanism: Negative Wall Charge

- Based on assumption of negative wall charging induced by FIB within HAR via.

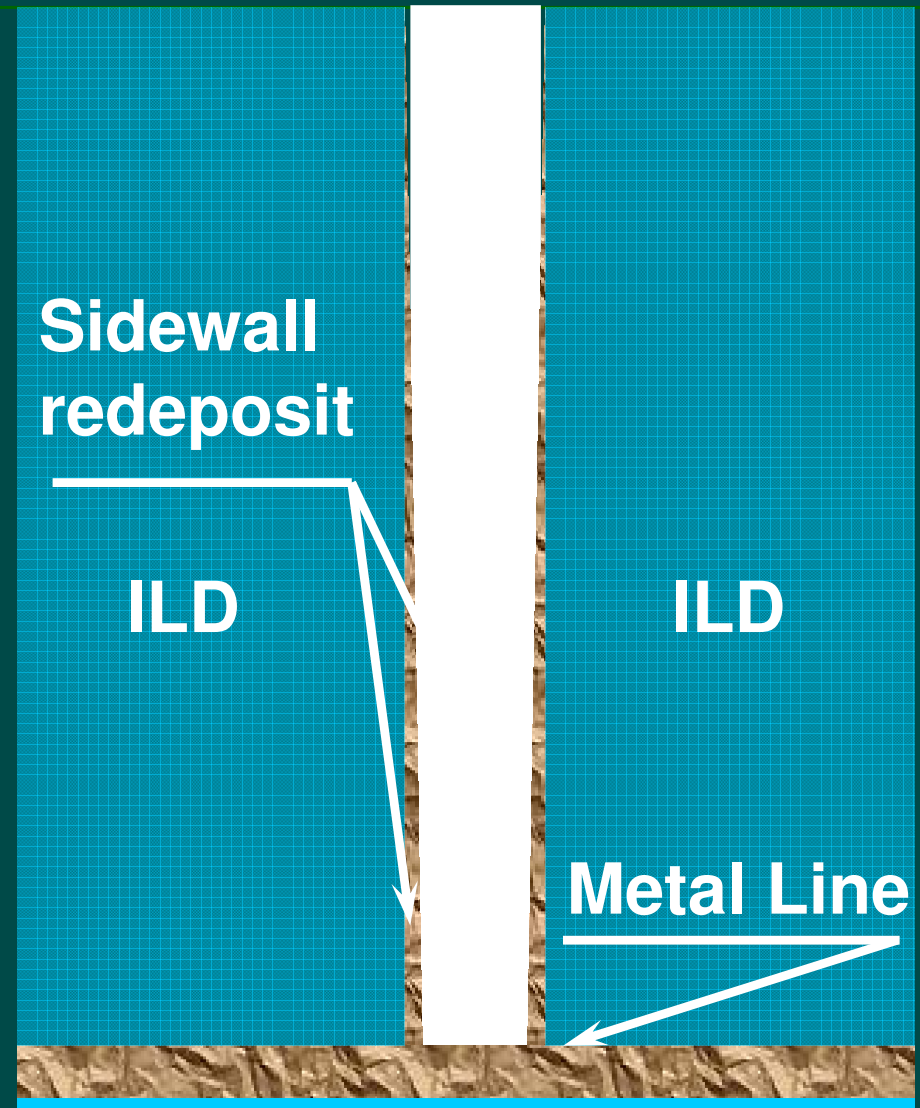
Proposed by T. Lindquist
ISTFA 2004



HAR Endpoint Mechanism: Metal Redeposition

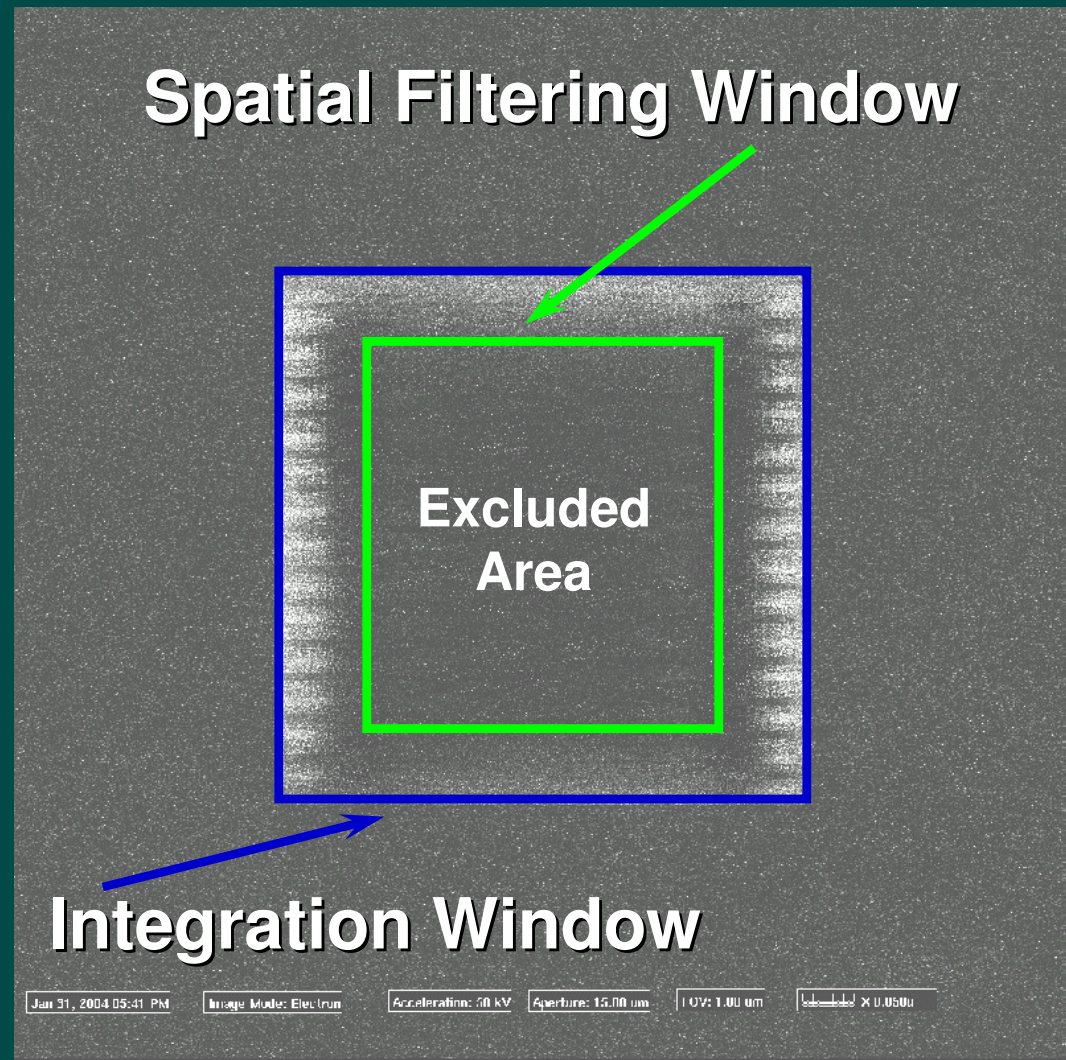
- Based on assumption of re-deposition of metal from conductor on walls of HAR via

Proposed by V. Ray
ISTFA 2005

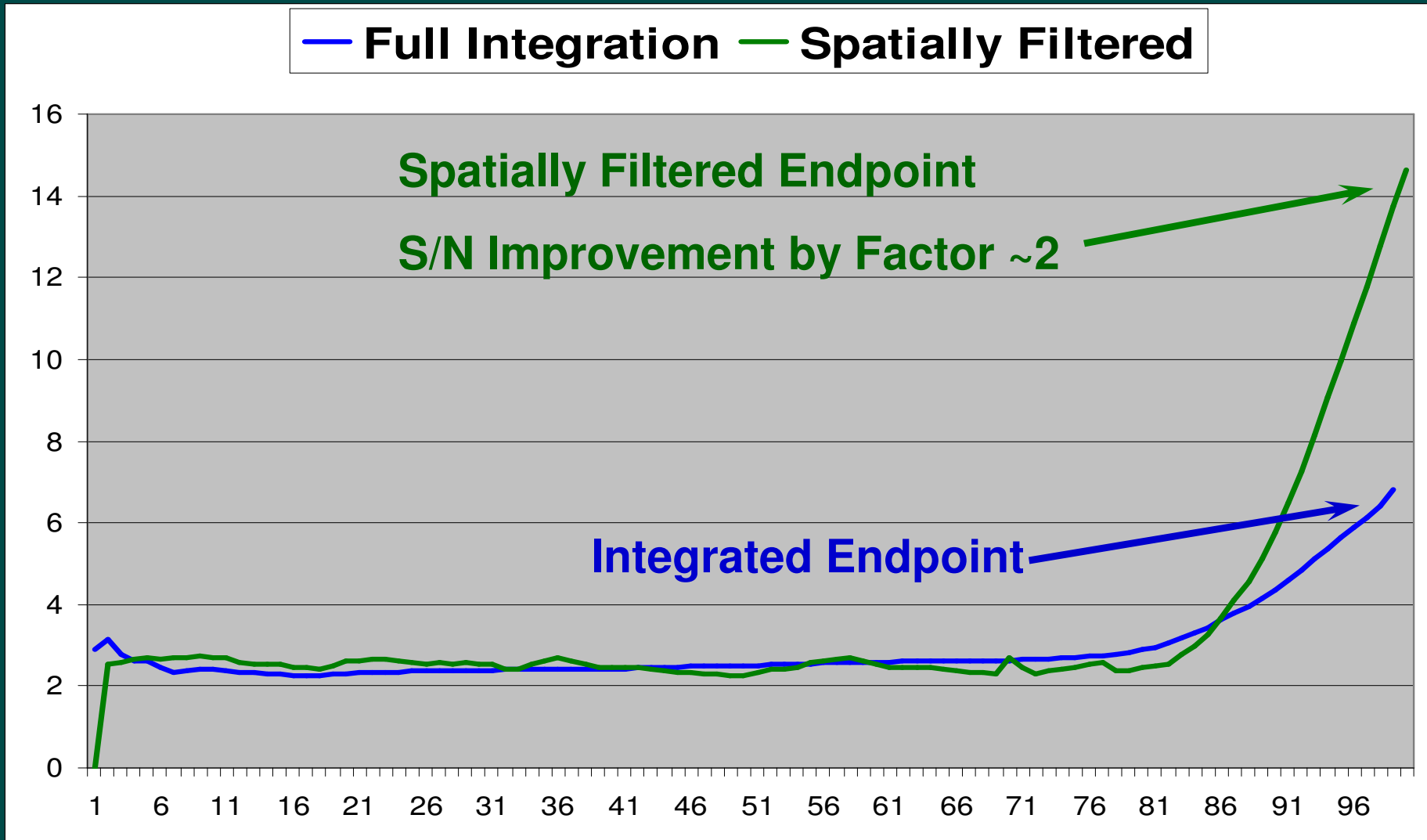


Observation of Endpoint Details

- Endpoint image of via with 10:1 aspect ratio
- FOV $1\mu\text{m}$ I_{Beam} 5 pA
- Spatial distribution of information is evident



Integration and Filtering



Summary

- **HAR Endpoint Information is available primarily on periphery of the via.**
- **Spatial filtering excludes ~ 80% of dwell points in center of the via from integration.**
- **Use of spatial filtering improves S/N of endpoint detection graph by factor ~ 2.**
- **Technique is equally applicable to sample current and secondary electron endpoint detection.**

www.partbeamsystech.com

EFUG 2006, Wuppertal, Germany