

# Processing of Endpoint Information from HAR Vias

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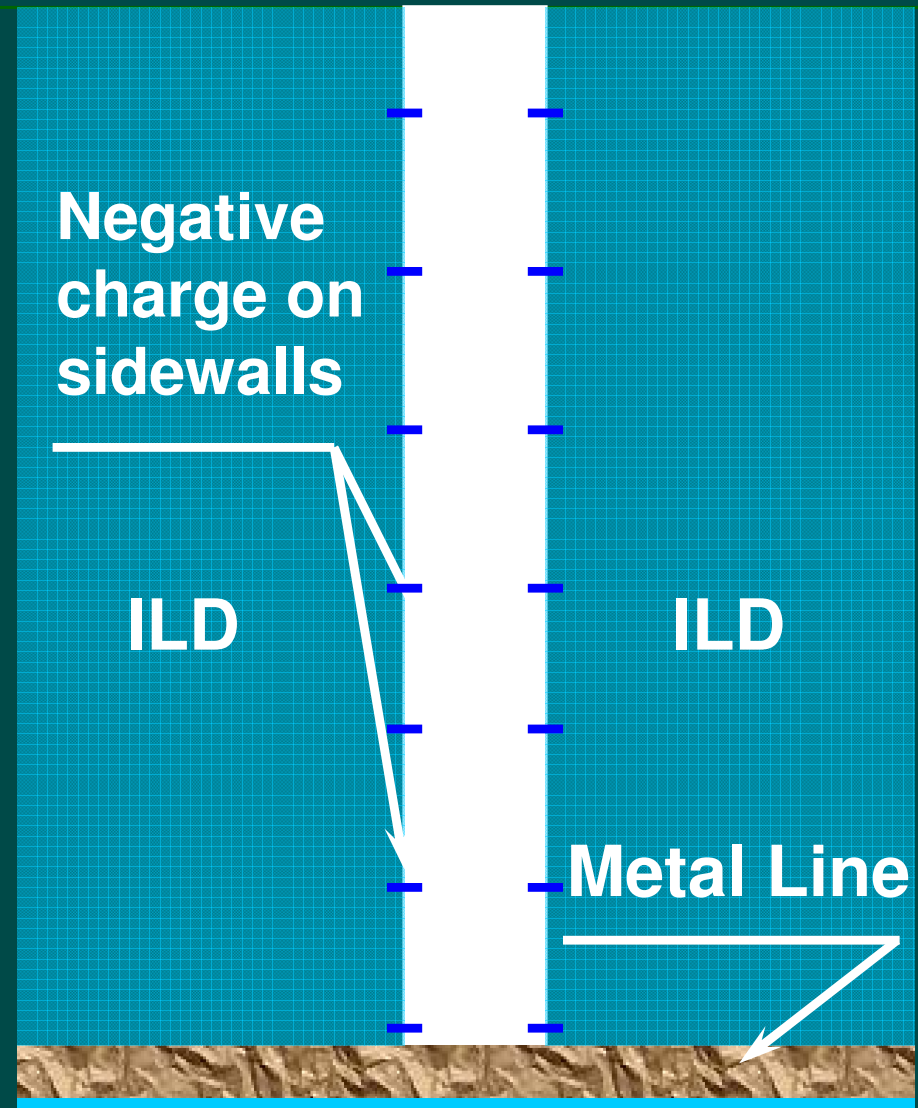
# Outline

- ◆ **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.

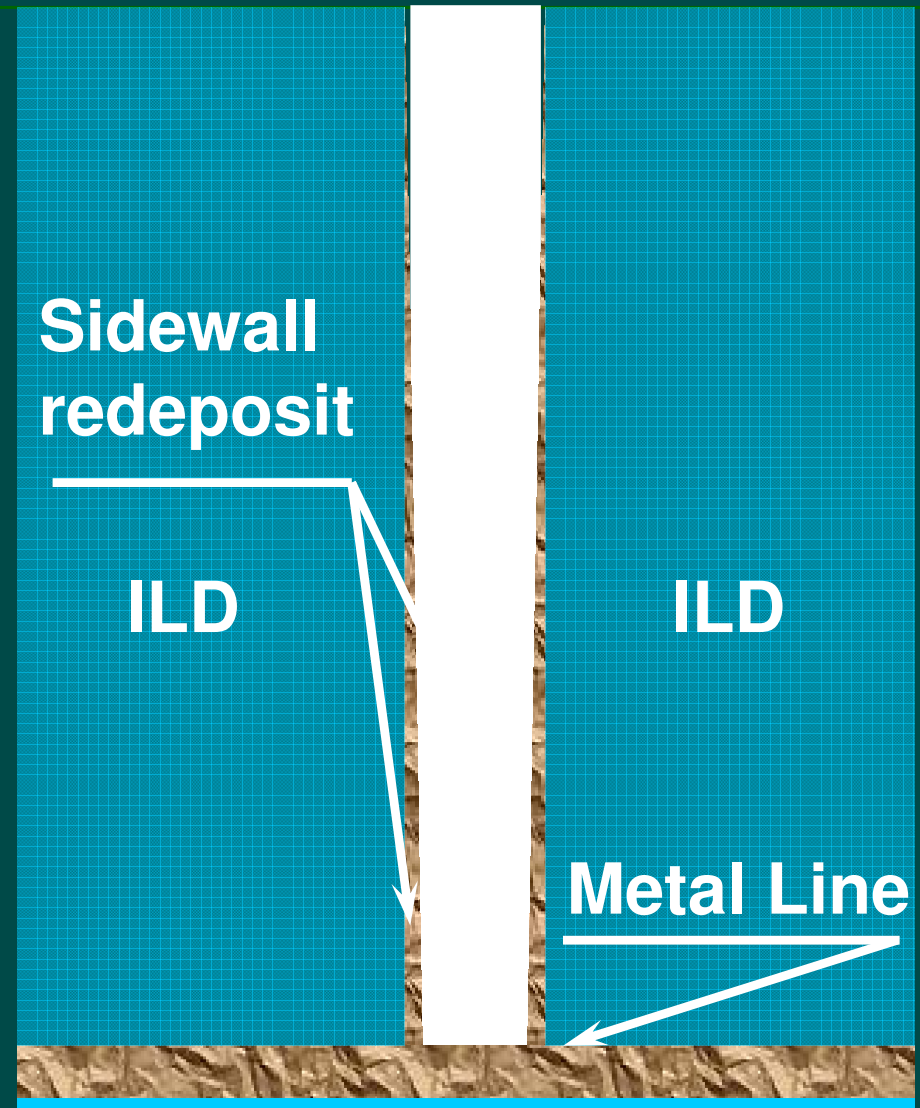
Proposed by T. Lindquist  
ISTFA 2004



# HAR Endpoint Mechanism: Metal Redeposition

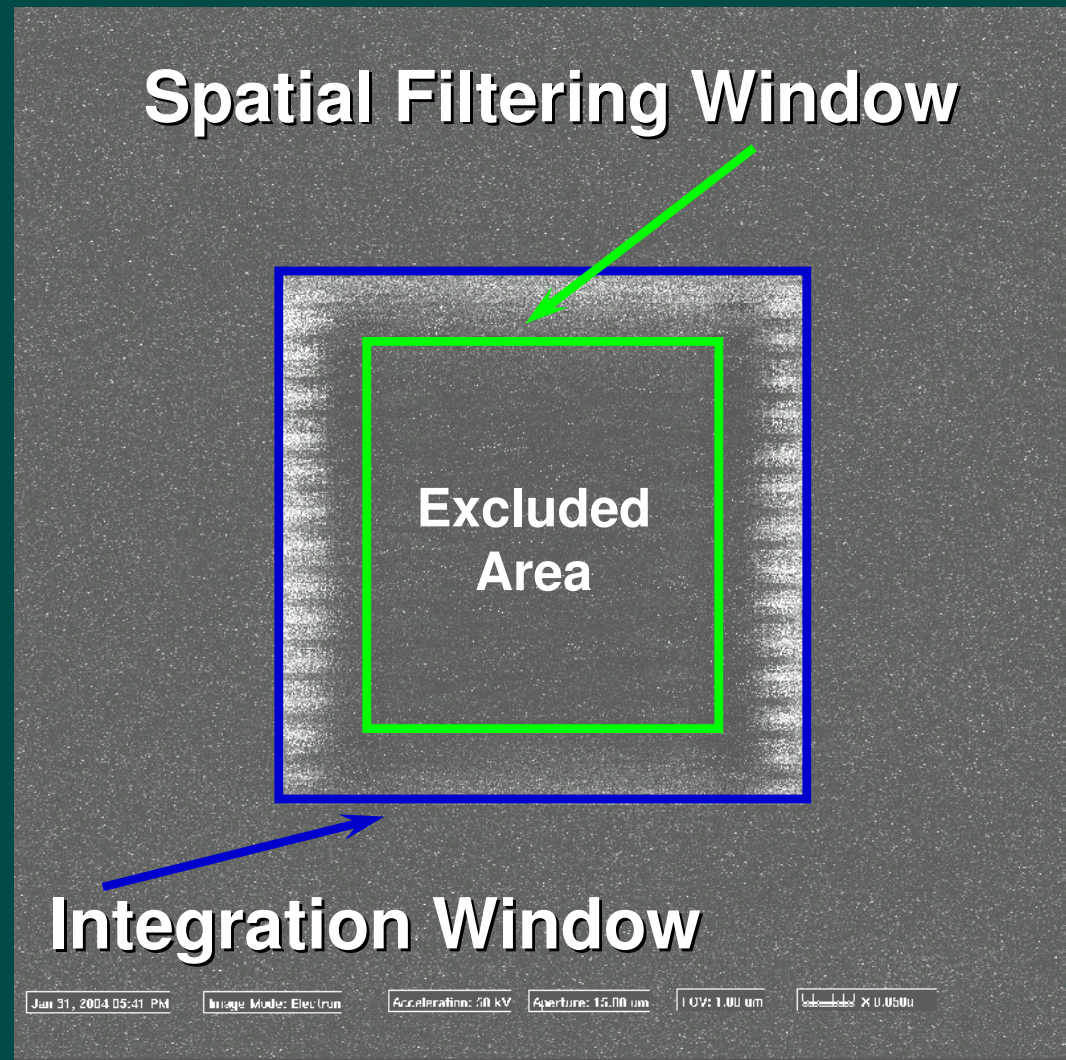
- Based on assumption of re-deposition of metal from conductor on walls of HAR via

Proposed by V. Ray  
ISTFA 2005

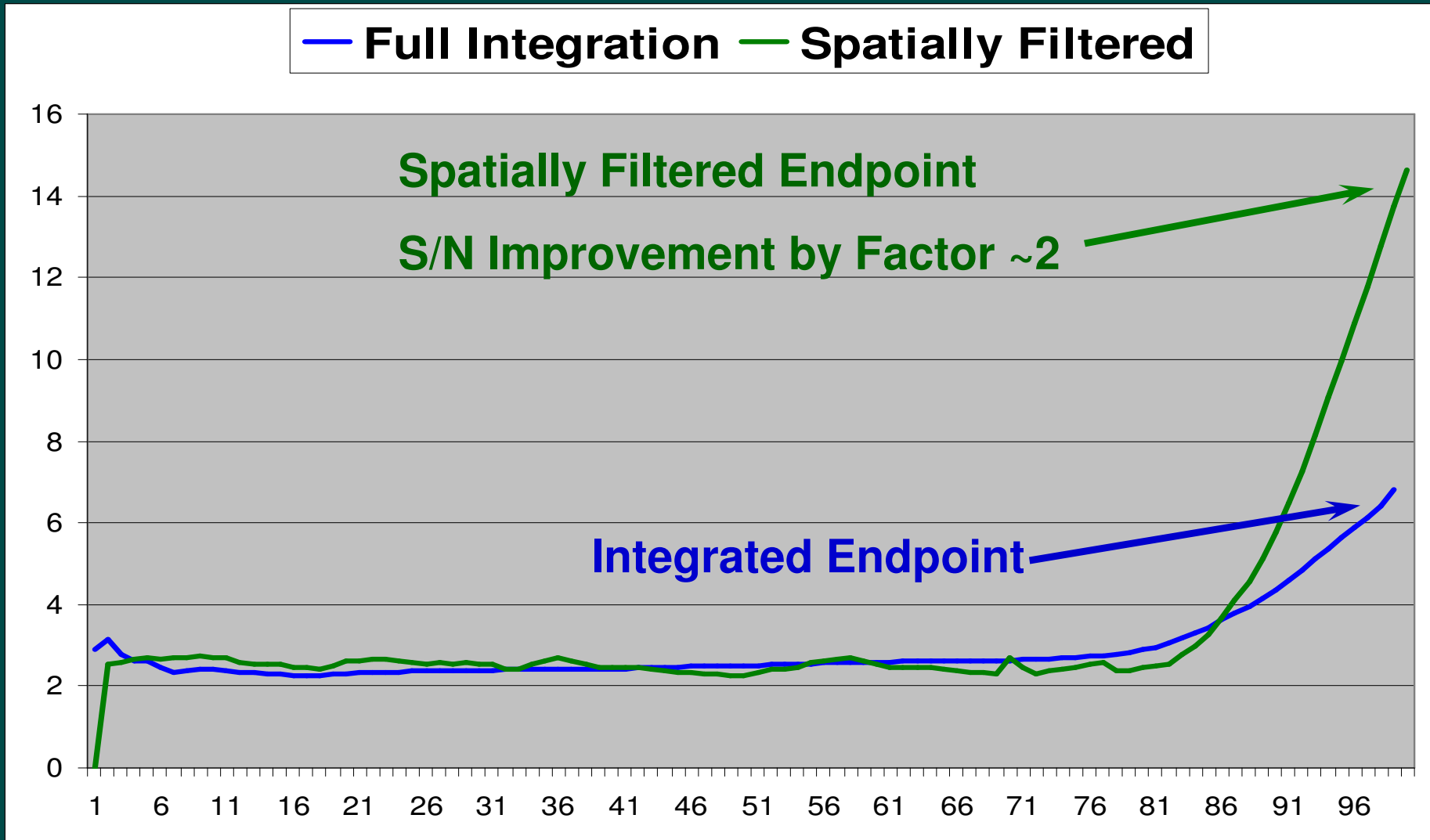


# Observation of Endpoint Details

- Endpoint image of via with 10:1 aspect ratio
- FOV  $1\mu\text{m}$   $I_{\text{Beam}}$  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](http://www.partbeamsystech.com)**

EFUG 2006, Wuppertal, Germany