Transition Edge Sensors:

Optimization of the Device Selection Process

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Topics

- Transition Edge Sensors
- Project
- Conclusions
- The Big Picture
- Acknowledgements
Transition Edge Sensors (TES)

Mo/CuMo wires

Si$_2$N$_4$

Si

Substrate

X-ray

TES Transition

Resistance

Temperature

Side view

Top view
TES-Device Selection

Major flat

Rows

Columns

Sweet Spot

4 inches

Major flat
Project

- Premise
  - Wafer manufacturing process is reproducible
  - Devices in the same position on different wafers should display the same properties
  - If the relationship between device position and its characteristics is defined, devices of specific characteristics can be chosen directly

- Project
  - Define the relationship between Device position and $T_c$
Setup

ADR Magnet

GRT Thermometer

TES

Cryostat

Temperature Controller

Resistance Bridge

Computer
Process

- Wire Devices
- Cool Down
- Temperature Control & Data Acquisition
- Data Analysis
Results
Low-$T_c$ Devices
Position-\( T_c \) Relationship
Conclusions

- Temperature control program worked well
  - User interface needs improvement
- The relationship between row position and $T_c$ was defined
  - Non-dependence on column position should be confirmed
The Big Picture

- X-ray and Gamma-ray Spectroscopy
- Homeland Security
- Medical Applications
- Astronomical Applications
Acknowledgements

- Funding for this work has been provided by NASA MU-SPIN NCC 5-534 and NASA OSS NAG 5-10145.
- Zaheer Ali and The Advanced Detector Group at Lawrence Livermore National Laboratory
- Dr. James Payne