Experience with and Studies of the SNS* Target Imaging System

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INTRODUCTION
The Target Imaging System (TIS) shows the size and position of the proton beam by using a luminescent Cr:Al2O3 coating on the SNS target.

TIS POSITION VERSUS BEAM POWER
TIS reported position is sensitive to beam power. Is there a problem with the optical path?

UNIFORMITY SCAN
The proposed Fusion Material Irradiation Test Facility (FMITS) puts tubes with materials in front of the target to study radiation damage. What effect has this on the TIS?

OPERATIONS
The TIS results, beam size, peak density, and position are used for:
• Errant Beam Monitoring
• Initial accelerator setup

The TIS runs:
• Mostly without interaction
• Reliably (few restarts per year)

LUMINESCENCE DECAY
Newly created software tool to analyze image and correct for differences in camera gain/exposure and beam intensity:
• Use for future studies on different coatings
• Decay due to protons (15%) & neutrons (85% but more uniform distribution)

REFERENCES

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CONCLUSION
• Tools have been created to study the characteristics of the TIS. These tools can be used to do future R&D to improve the TIS.
• The TIS is sensitive to beam power but we have characterized this and can correct dependency.
• The TIS can function, given certain FMITS tube configurations.