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SNS linac wire scanner system

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The linac wire scanner system for the Spallation Neutron Source at Oak Ridge, TN, USA, calls for 5 units in the medium energy beam transport, 5 in the drift tube linac (DTL), 10 in the coupled cavity linac (CCL), and 32 in the superconducting linac (SCL). The DTL and CCL units will use straightforward linear actuators. The SCL units must operate in an ultra-clean, ultra-high vacuum, high-reliability environment. A custom-built pivoting design will be used in this area. In this paper we will discuss the mechanical and electrical designs of the SNS linac wire scanner system, and present an analysis of the errors in position and profile measurement as functions of wire position and electrical signal errors.

I. Introduction

- A. Brief summary of the SNS project?
- B. Brief summary of all the linac diagnostics instrumentation.

II. Zero in on the DTL BPM system

- A. No other accelerator has BPMs inside drift tubes?
- B. Design details.
 - 1. *Kapton cables.*
 - 2. *Home-made rad-hard SMA dielectric.*
 - 3. *Pickups centered in drift tubes.*
 - 4. *Process at 2 x DTL freq.*
 - 5. *DTL tank 1 drift tubes too short for any BPMs.*
- C. John and Matt section on electronics.

III. Zero in on the SCL WS system

- A. Pivoting SCL WS actuator.
- B. Design details.
- C. Positioning accuracy measurements.
- D. Cycling tests.
- E. Signal level expectations
- F. Wire heating
 - 1. *Wire selection.*
 - 2. *Duty factor limitations.*
- G. Mention Chris' paper for electronics.