



THOMPSON RIVERS
UNIVERSITY

Fusion Energy: General Fusion

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March 31, 2015

Overview

1 General Overview

- Purpose/Function
- Problems
- Chain Drive Design

2 Performance

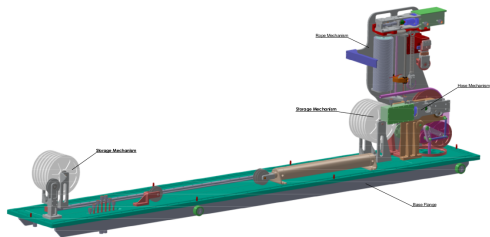
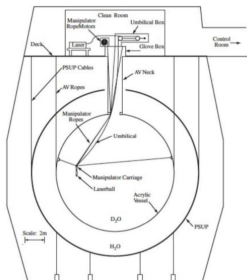
- Data
- Implementation

3 Future Goals

- Next Steps

URM Function

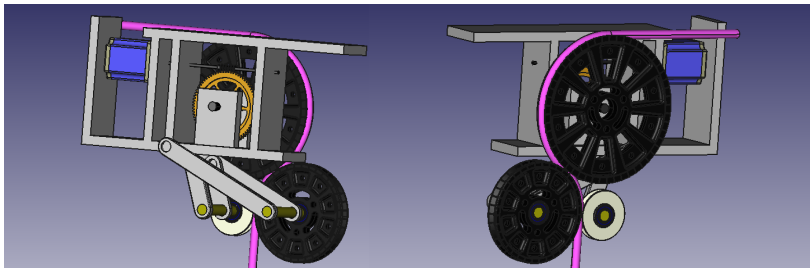
Controls the deployment and storage of the source umbilical for the SNO+ detector



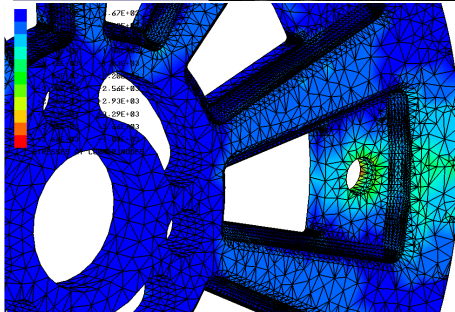
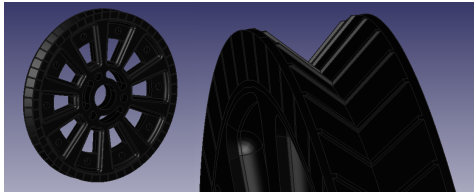
URM Problems

Sources of Slippage:

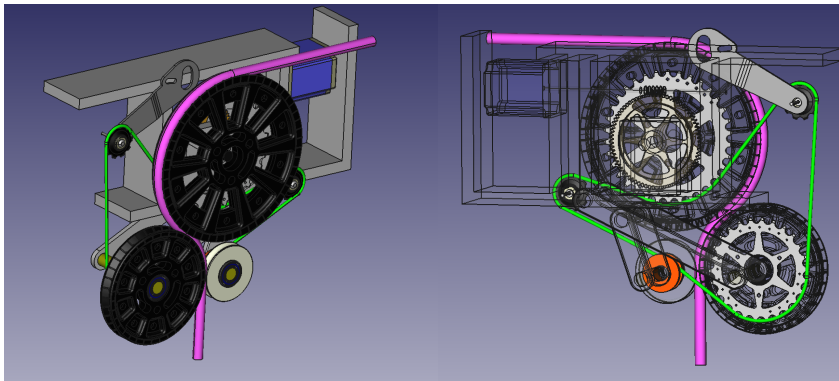
- 1 LAB for Scintillation (low coefficient of friction)
- 2 LAB compatible umbilical
- 3 Pulley Design (collects LAB reducing friction)
- 4 Umbilical Storage System (Pneumatic Cylinder)



The Drive Pulley Design

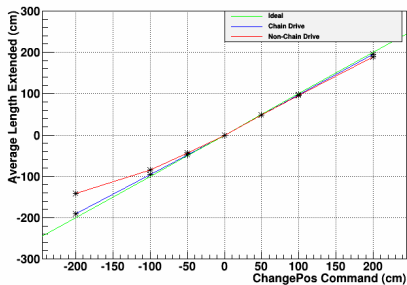


Chain Drive Design

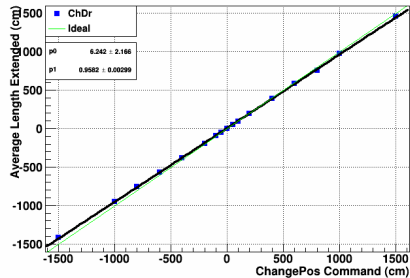


Chain Drive vs Non-chain drive

Average URM Extension/Retraction vs ChangePos

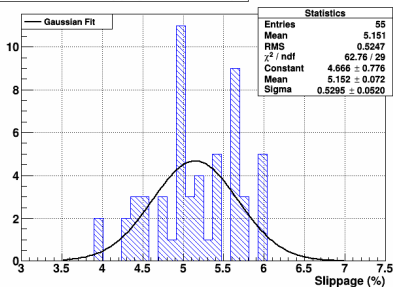


URM Extension/Retraction Fit

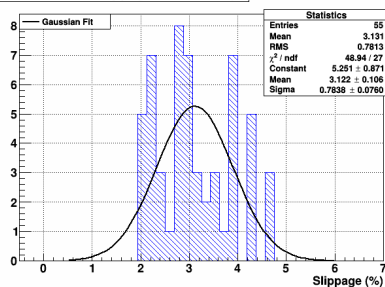


Chain Drive Consistency

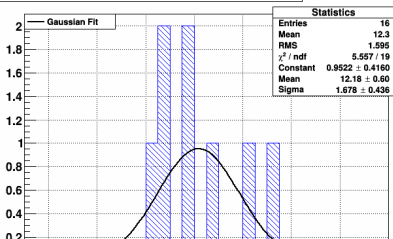
URM Extension Slippage Consistency



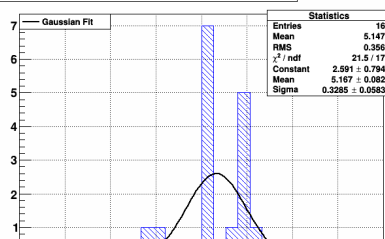
URM Retraction Slippage Consistency



URM Extension Slippage Consistency (Non-Chain Drive)

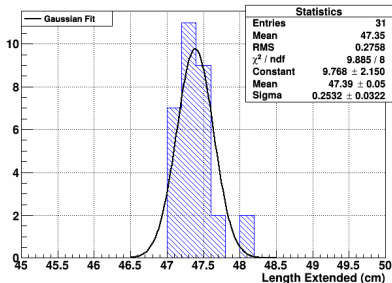


URM Retraction Slippage Consistency (Non-Chain Drive)

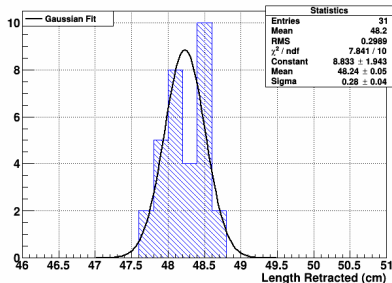


Chain Drive Consistency

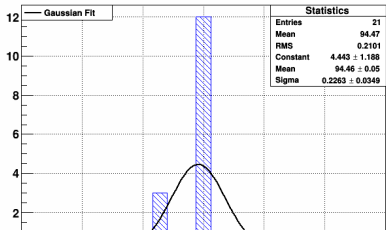
URM Extension Slippage Consistency (ChangePos -50)



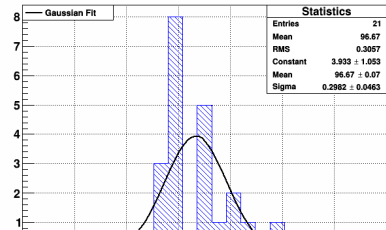
URM Retraction Slippage Consistency (ChangePos 50)



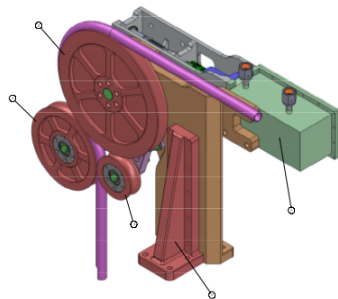
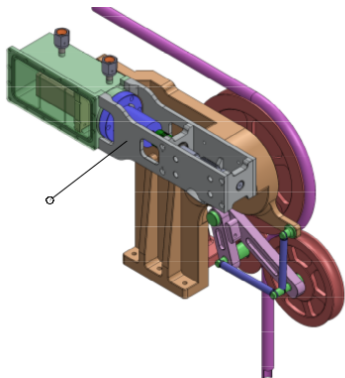
URM Extension Slippage Consistency (ChangePos -100)



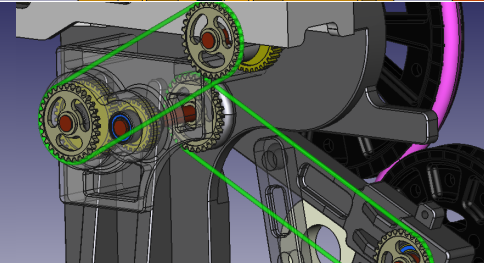
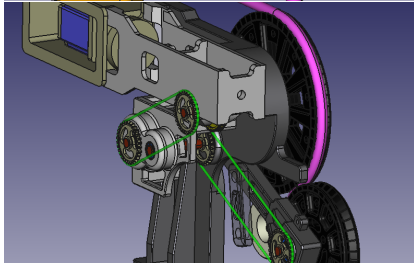
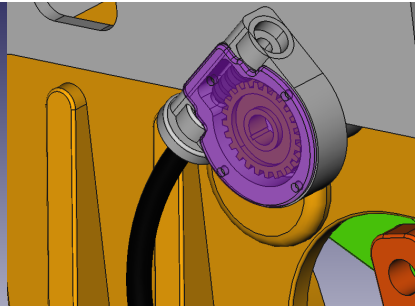
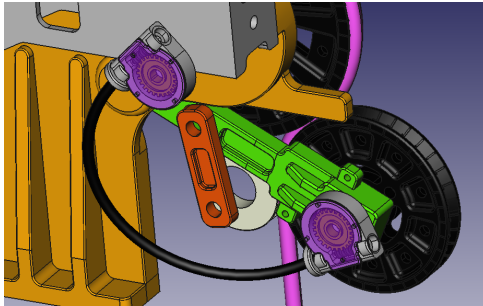
URM Retraction Slippage Consistency (ChangePos 100)



New URM Design



Flex Drive and Gear/Chain Drive



Future Goals

Next Steps:

- 1 Investigate the possible Improvements of driving small pulley
- 2 Complete LAB application system
- 3 Investigate Implementing Drive System to new URM design

References



[Lawrence Garcia \(2014\)](#)

Umbilical Tests and Detector Data Analysis



[Jose Maneira, Rui Alves \(2013\)](#)

URM design for SNO+, LIP-Coimbra

Thank-you