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PROGRESS UPDATE ON THE ATLAS MULTI- USER UPGRADE AT ARGONNE



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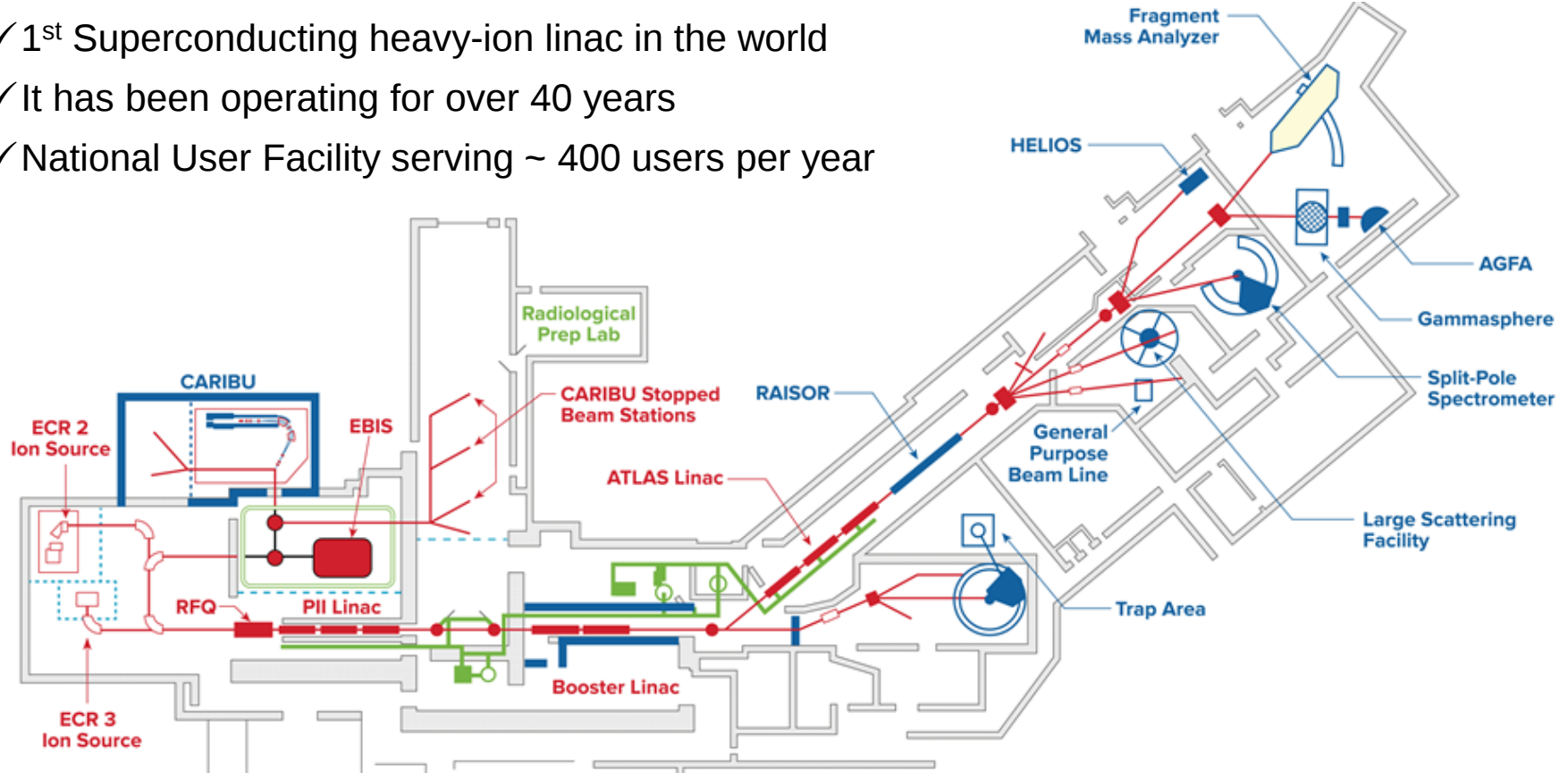


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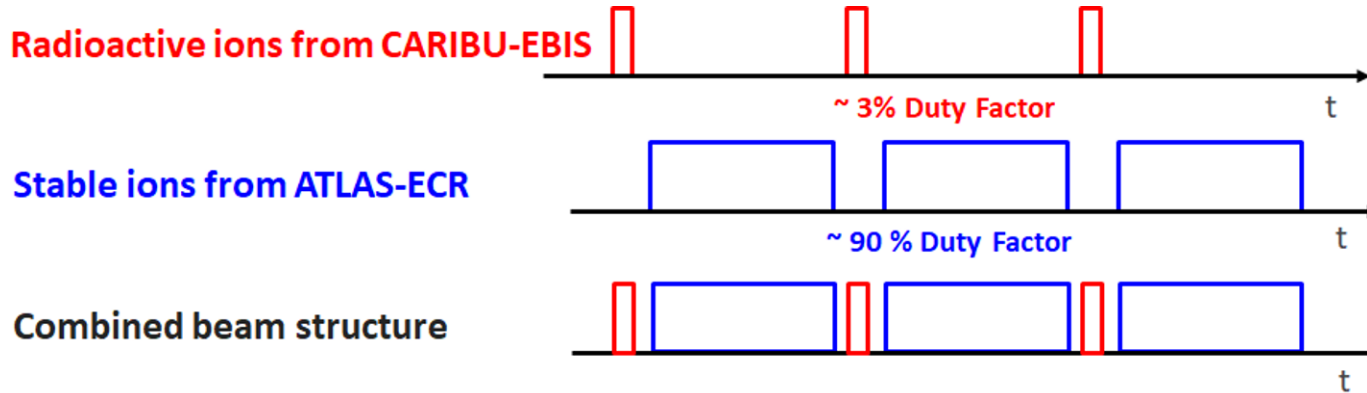
ATLAS FACILITY AT ARGONNE NATIONAL LAB.

- ✓ 1st Superconducting heavy-ion linac in the world
- ✓ It has been operating for over 40 years
- ✓ National User Facility serving ~ 400 users per year



ATLAS MUU – MOTIVATIONS & BASIC CONCEPT

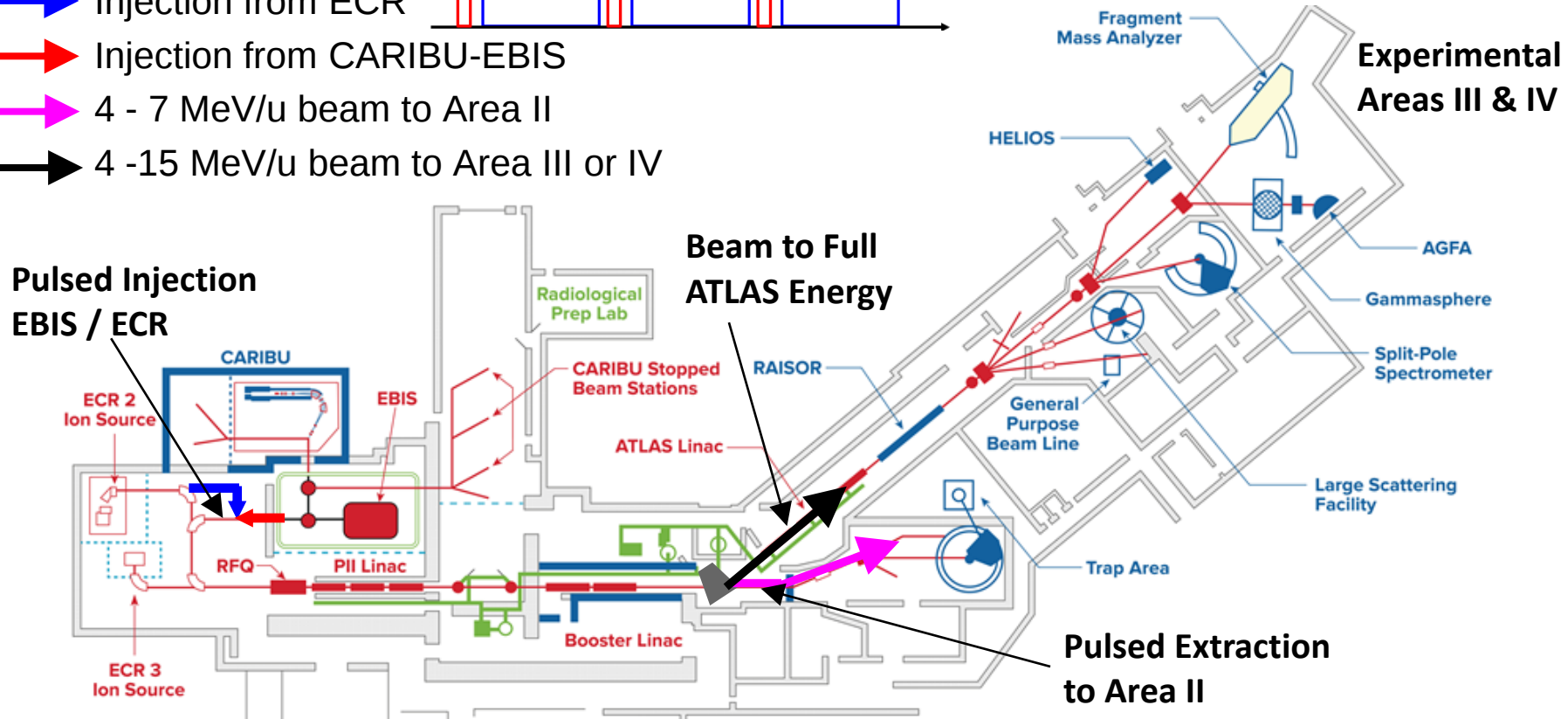
- Relieve pressure on beam time, accomplish more physics by serving more users
- When running pulsed nu/CARIBU beams, the machine is “empty” ~ 90% of the time while operating CW → Take advantage of that time
- Demonstrate multi-user capabilities that can be a model for similar facilities...



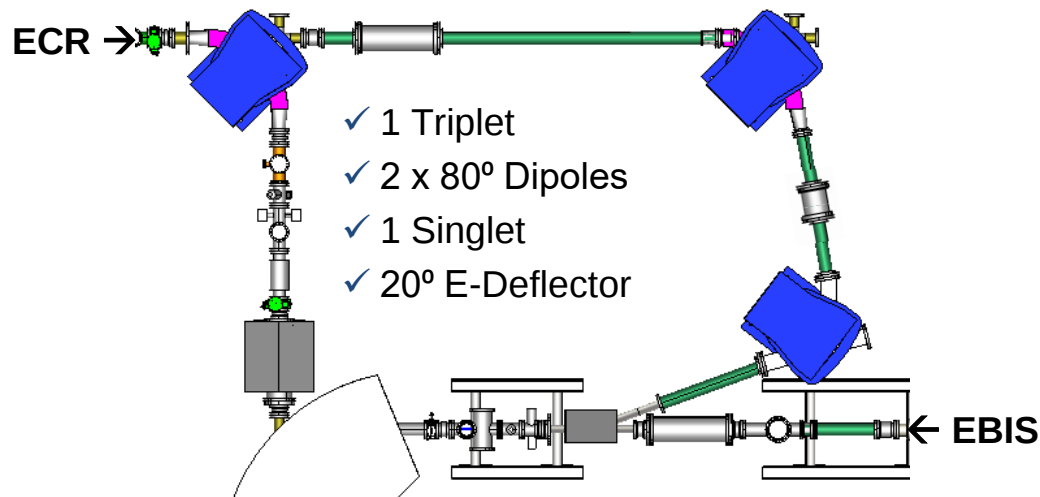
- nu/CARIBU beams are typically charge-bred to $A/q \geq 4$, ATLAS accelerates beams with A/q ratios ≤ 7 → A/q overlap is 4-7

ATLAS MUU – SCOPE & IMPLEMENTATION

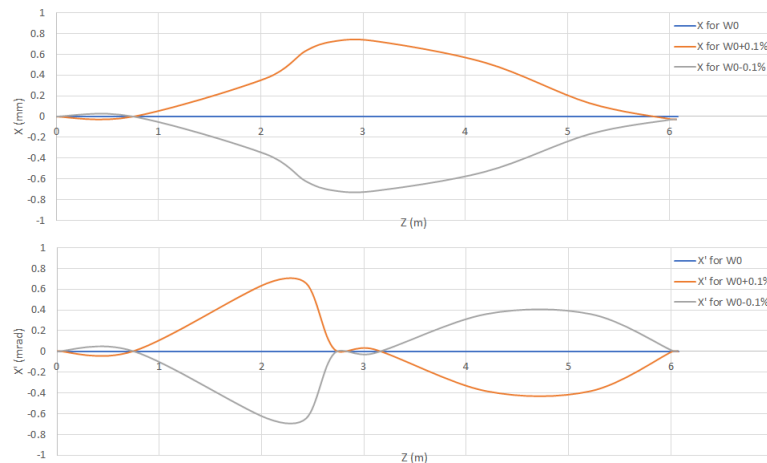
- ➡ Injection from ECR
- ➡ Injection from CARIBU-EBIS
- ➡ 4 - 7 MeV/u beam to Area II
- ➡ 4 -15 MeV/u beam to Area III or IV



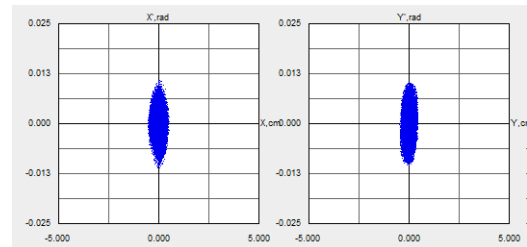
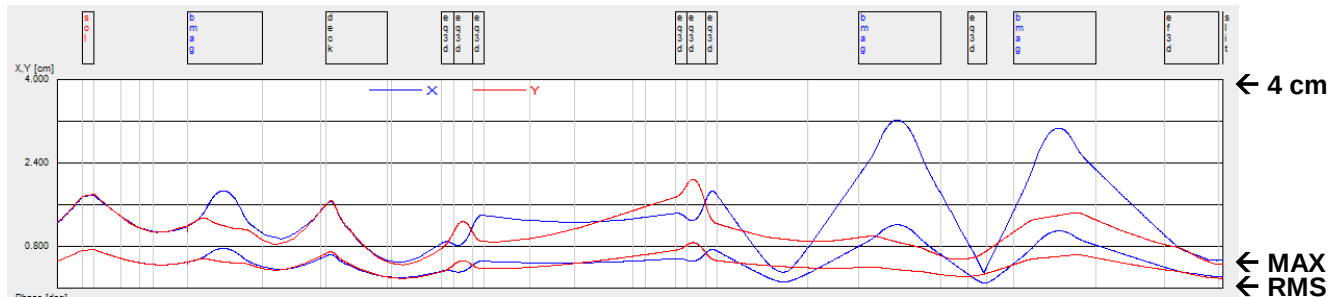
ATLAS MUU – INJECTION DESIGN



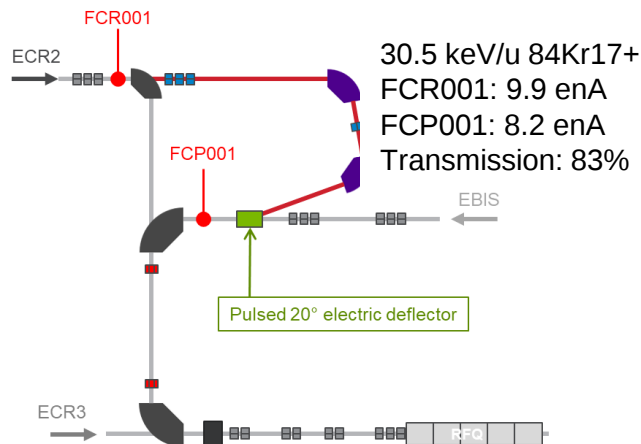
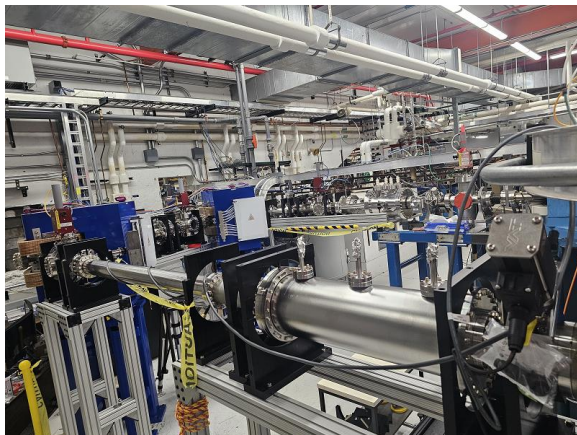
Achromatic Beam Transport



ECR → T-1 T-2 80° S 80° 20° ED

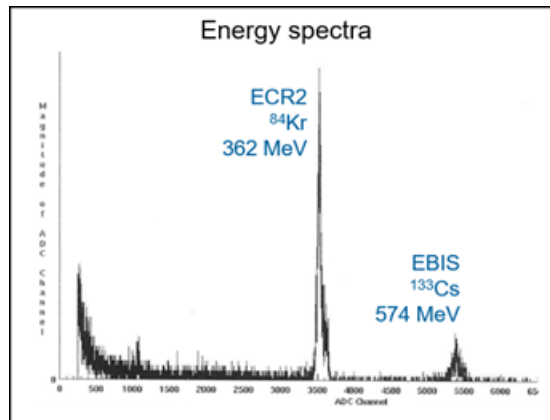
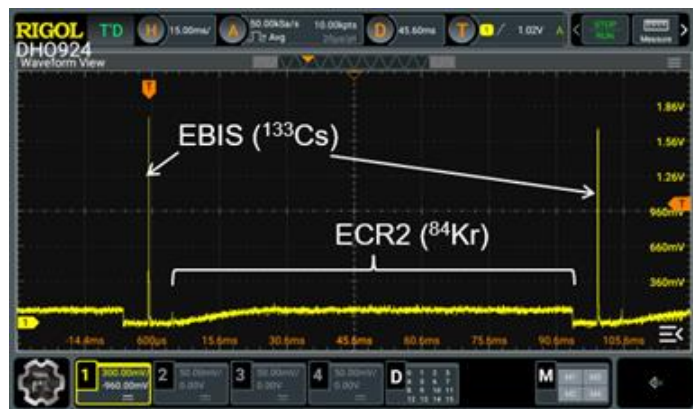


INJECTION - INSTALLATION & COMMISSIONING



Experimental Conditions

- One beam from EBIS: [$^{133}\text{Cs}^{27+}$]
- One beam from ECR2: [$^{84}\text{Kr}^{17+}$]
- Mass-to-charge ratio: 4-6
 $[\text{Cs-4.922; Kr-4.935;}$
 $\sim 0.3\% \text{ difference}]$
- Accelerated in PII and Booster:
 $> 4 \text{ MeV/u}$ [4.3 MeV/u]
- Frequency: 10 Hz
- EBIS beam width $< 200 \text{ ms}$
- Pulsed deflector configuration:
 90 ms ON (ECR2 injection),
 10 ms OFF (EBIS injection)

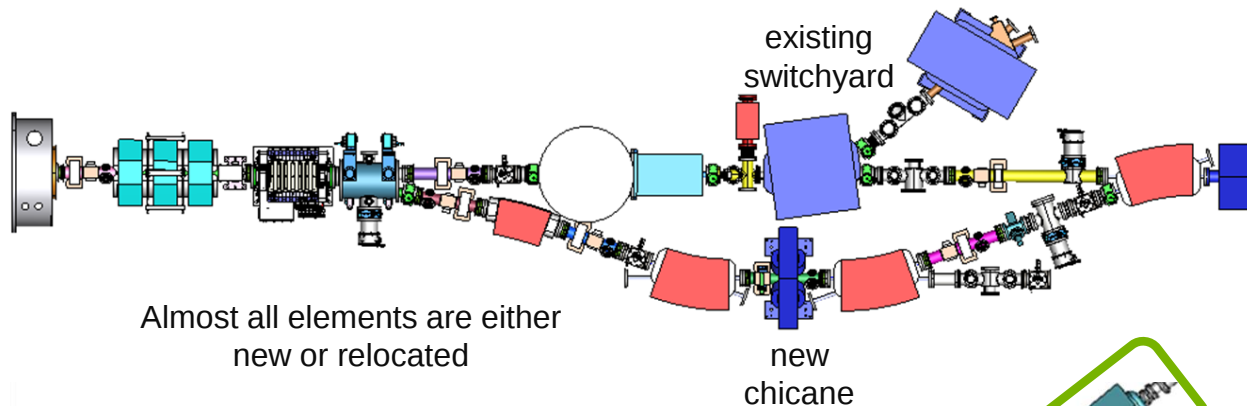


Thanks to C. Dickerson,
 R. Vondrasek, R. Scott
 and J. McLain

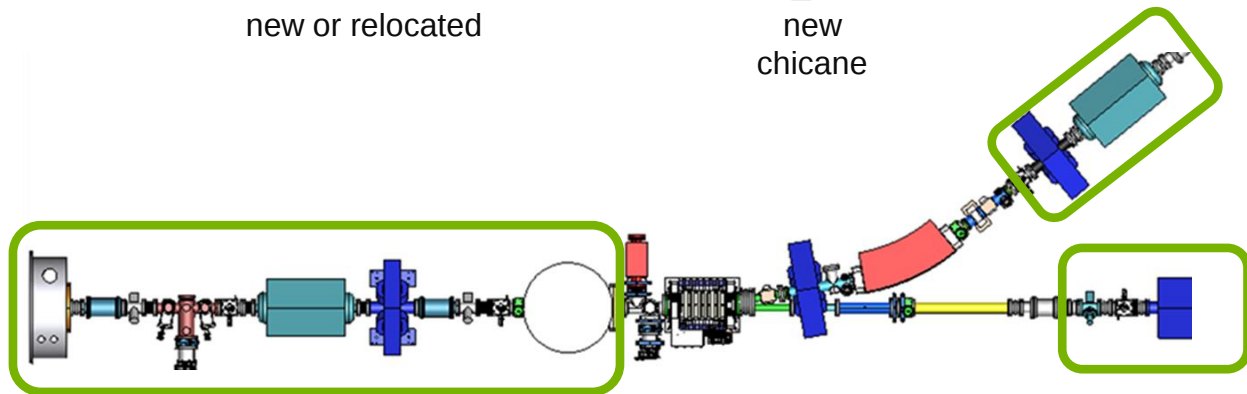
ATLAS MUU – CHANGE IN EXTRACTION DESIGN

A technical redesign simplifies reconfiguration in the ATLAS Booster

- **Initial design:**
added a
new chicane
to preserve the
existing switchyard



- **Redesign:** Requires reconfiguration of the switchyard but greatly reduces overall effort and requires few procurements



Equipment in green boxes stays put



THANK YOU



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