



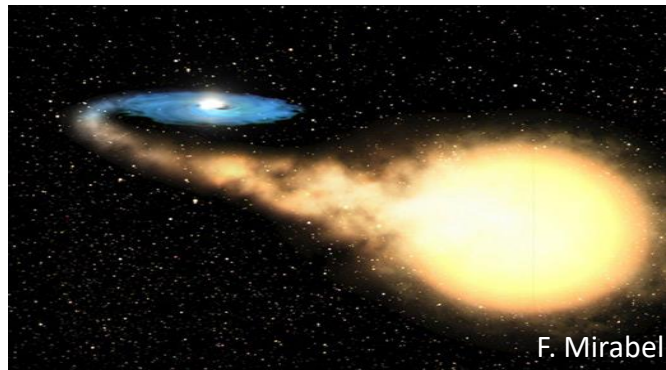
# Moving towards first science with the St. George recoil separator

Zach Meisel  
DNP 2015, Santa Fe, NM

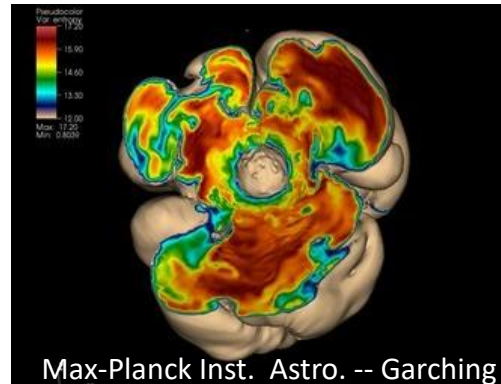


# $(\alpha, \gamma)$ reactions play an important role in astrophysics

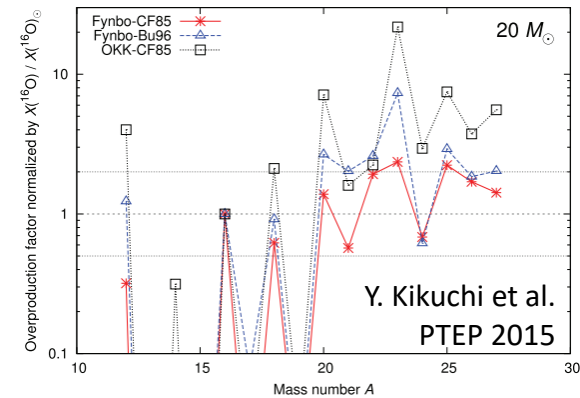
Type-I x-ray burst  
recurrence time:  $^{15}\text{O}(\alpha, \gamma)$



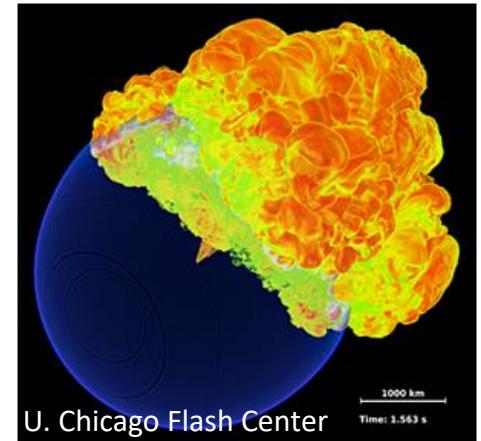
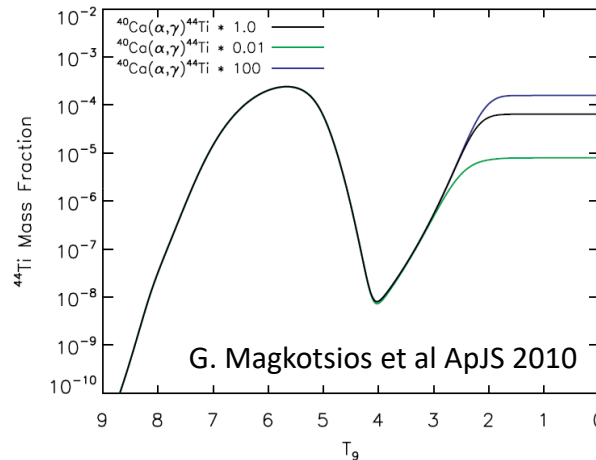
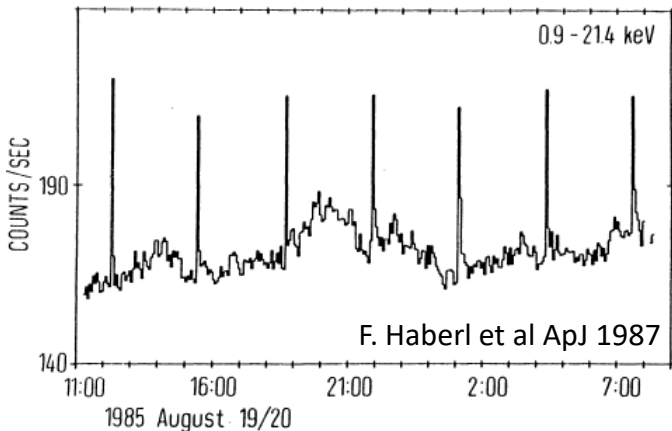
Core-collapse supernova  
nucleosynthesis:  $^{40}\text{Ca}(\alpha, \gamma)$



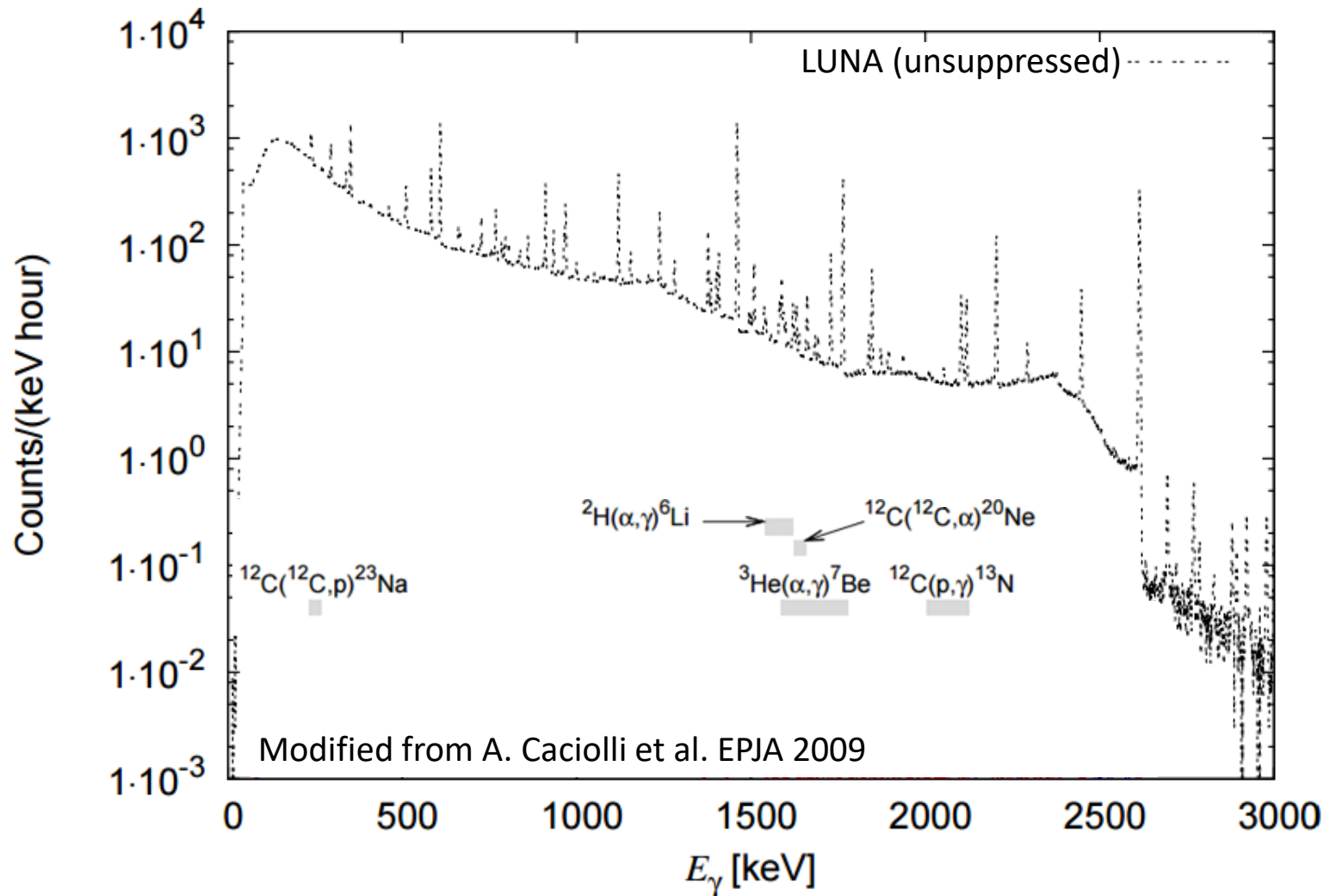
Stellar burning  
C/O ratio:  $^{12}\text{C}(\alpha, \gamma)$



BURSTS FROM 4U/MXB 1820-30



# Traditional ( $\alpha, \gamma$ ) measurement techniques suffer from background



# Need a way to increase Signal/Noise

## Option A:

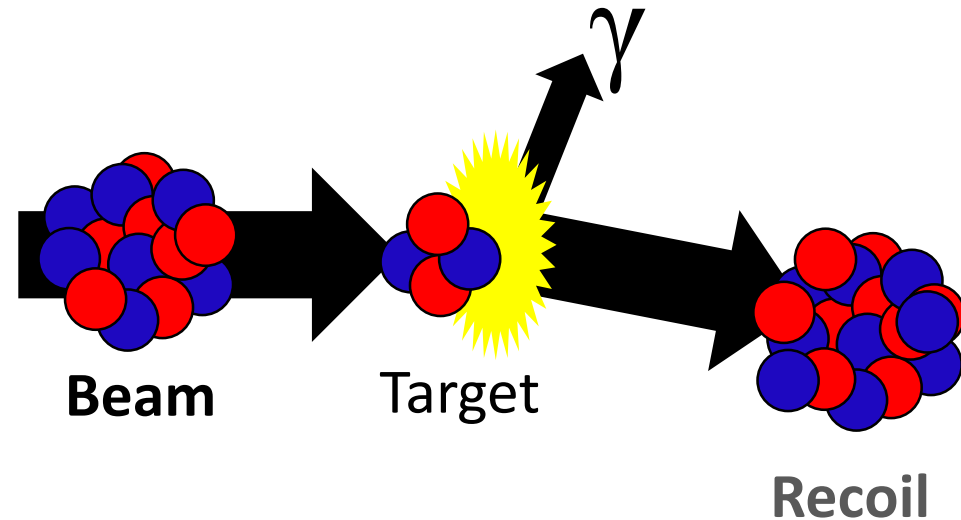
Go underground (& shield)



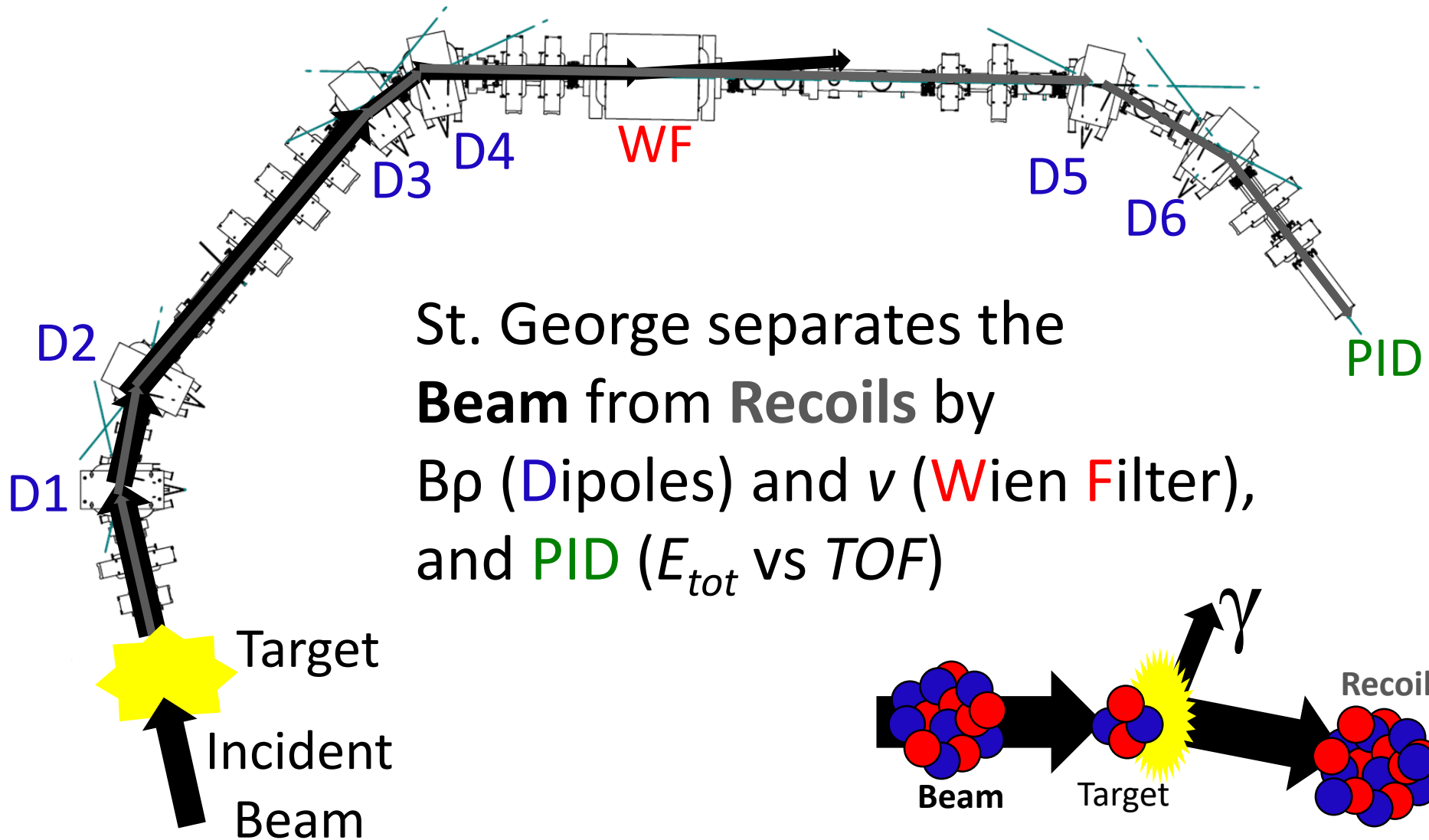
Approach adopted by LUNA (Gran Sasso)  
and CASPAR @ SURF (South Dakota)

## Option B:

Detect the recoil (inverse kinematics)

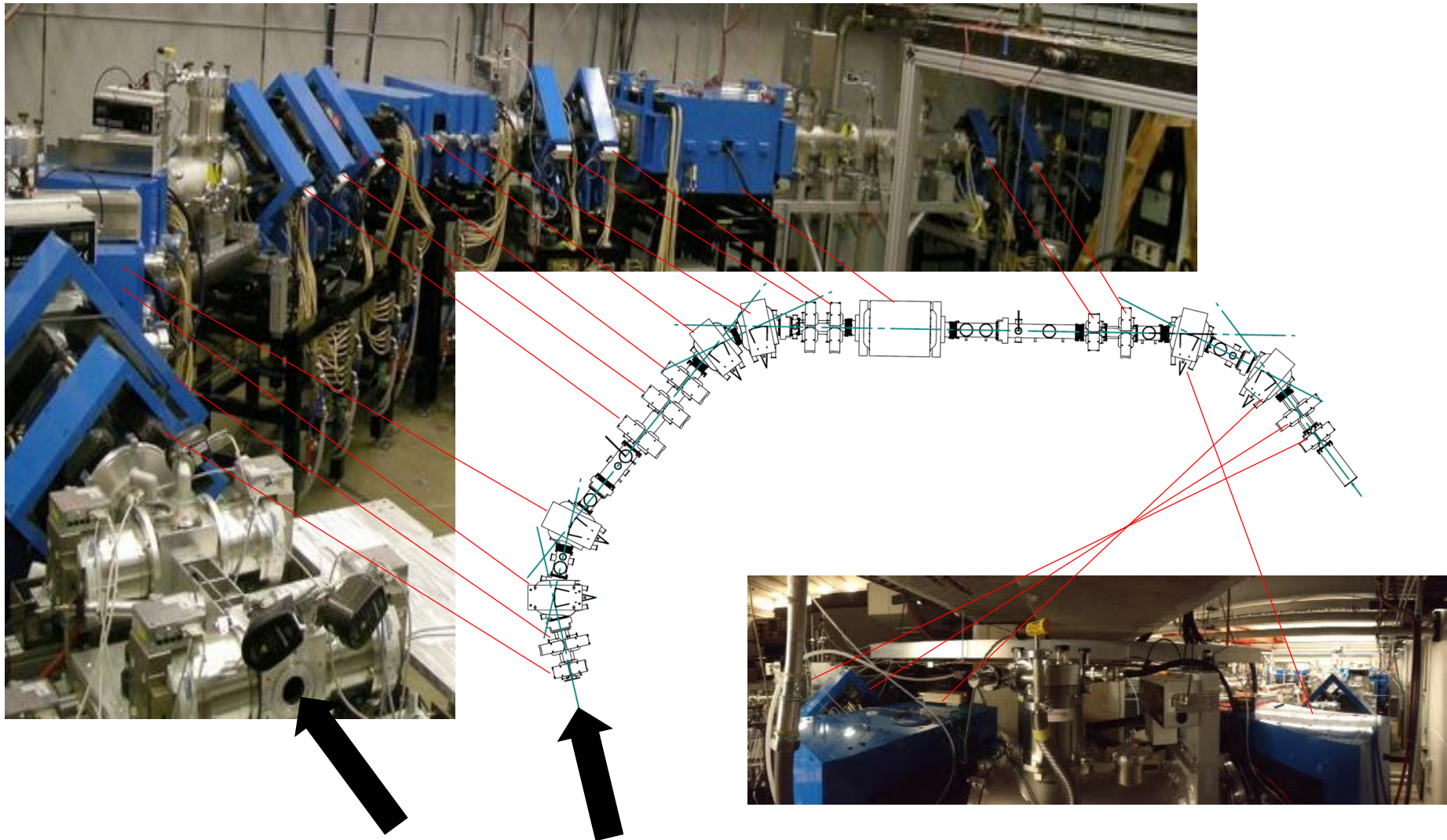


# Recoil Mass Separator Technique

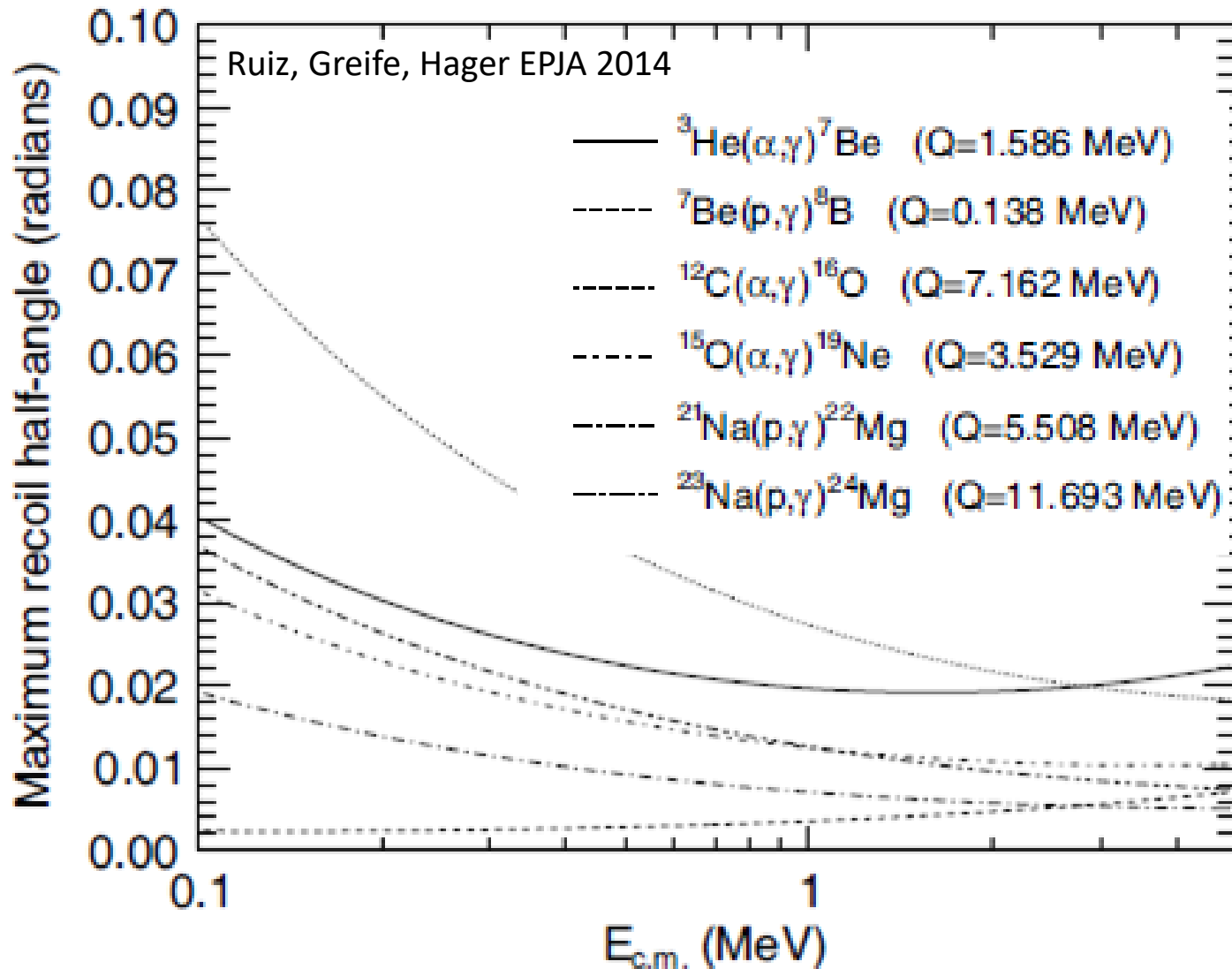




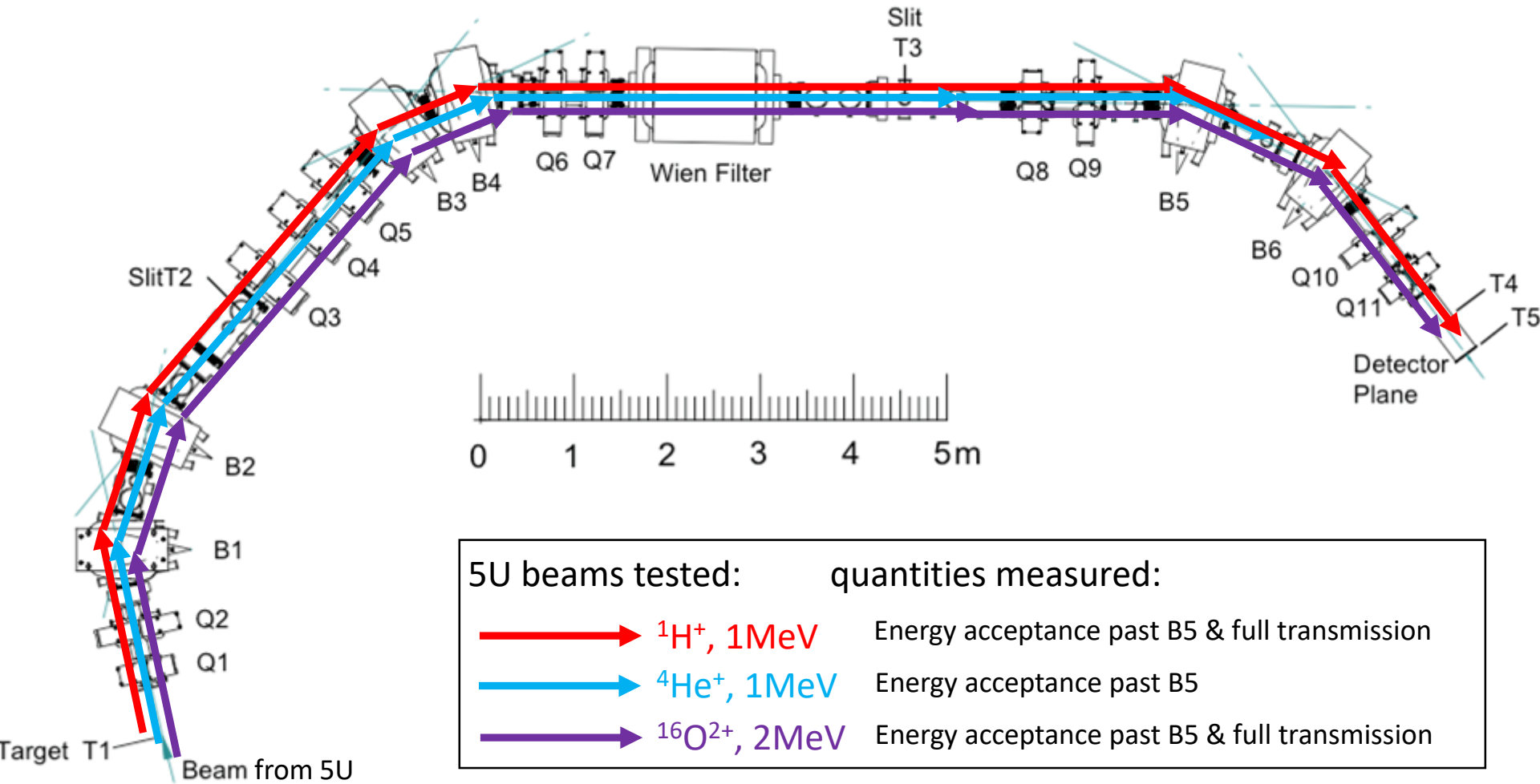
# St. George



# Challenge: Recoil angular & energy distributions

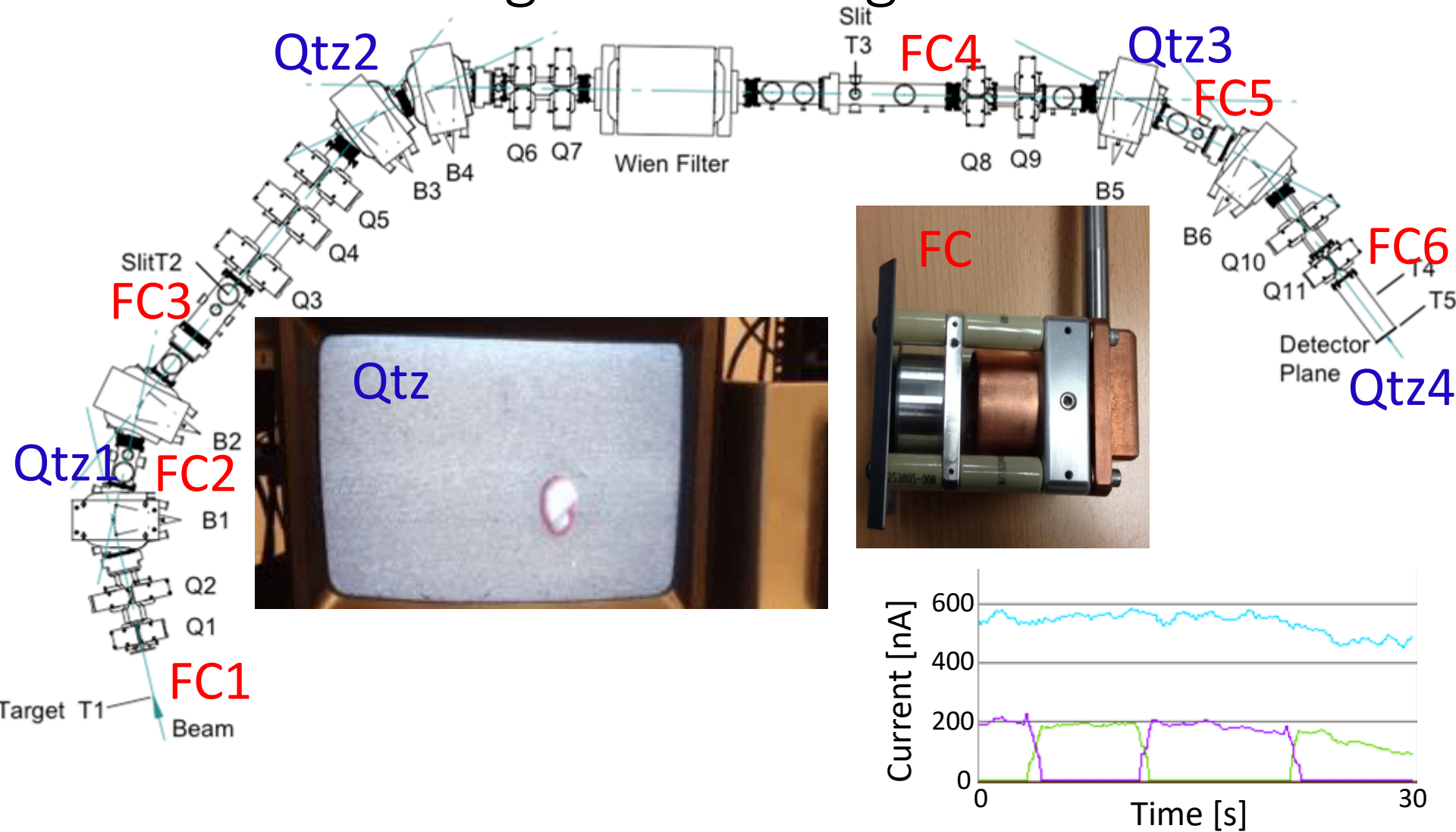


# Characterize acceptance with primary beams

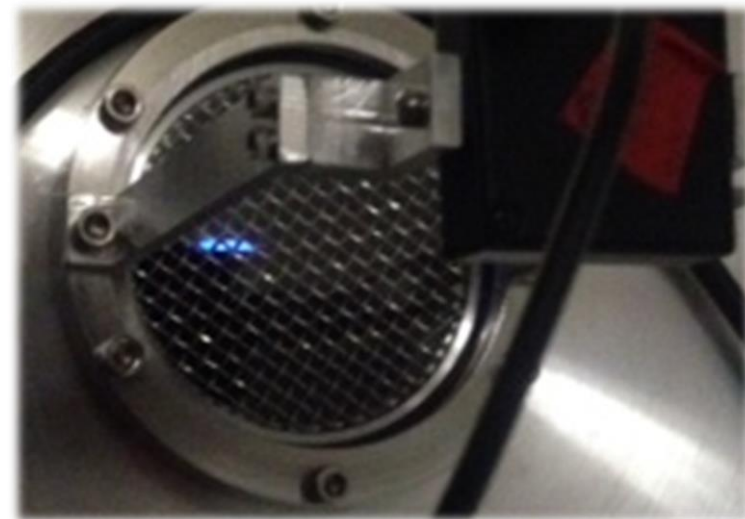
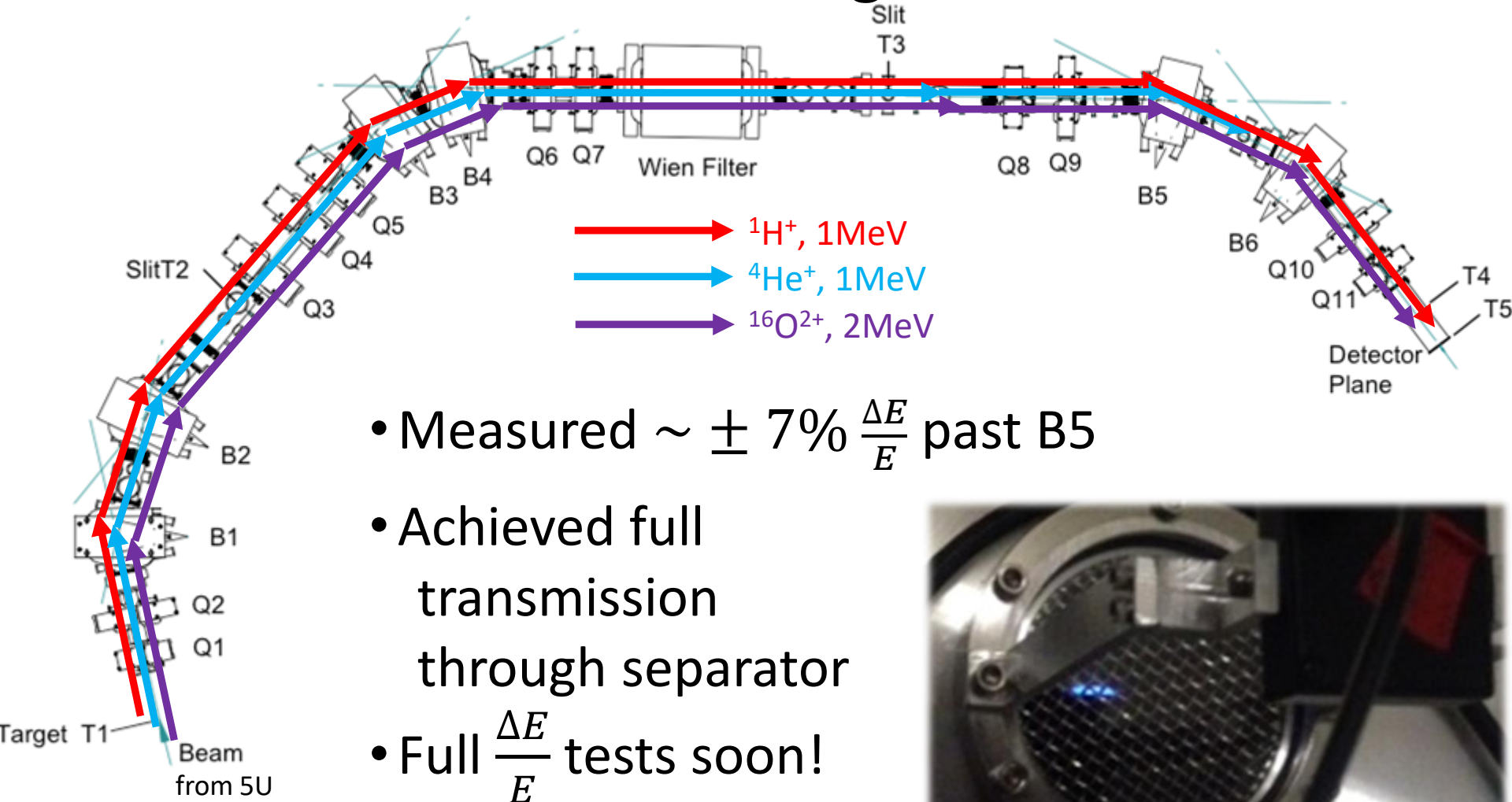




# Recently developed tuning procedure, using several diagnostics



# Commissioning Status



# Thanks To:

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- M. Couder
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