

Status of TRIUMF

DNP06 business meeting

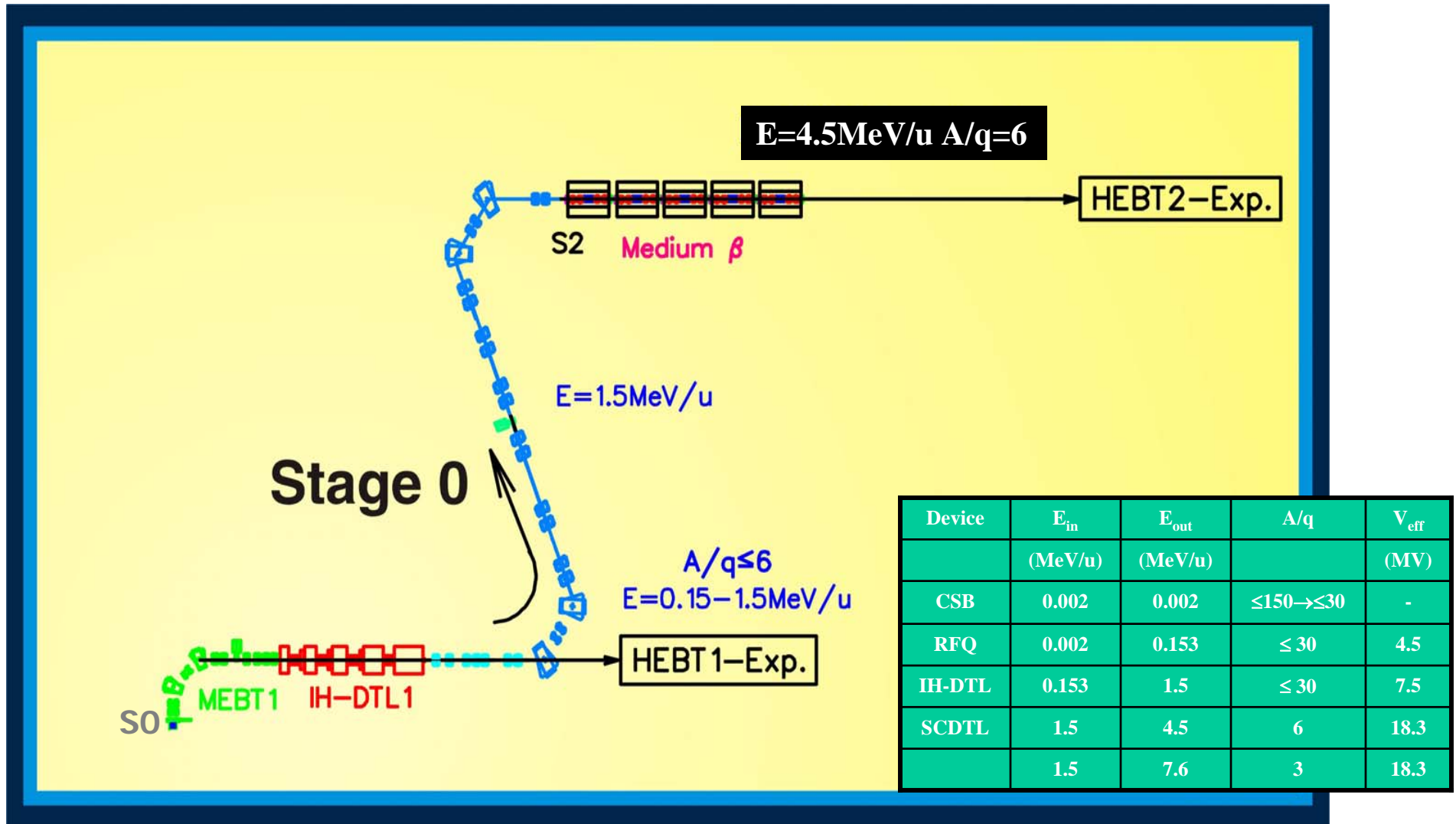
ISAC status

- First operation of ISAC II superconducting LINAC
- First operation of ISAC target at 100 μ amps.(for ^{11}Li RIB operation)
- Instruments: TITAN,TIGRESS,EMMA

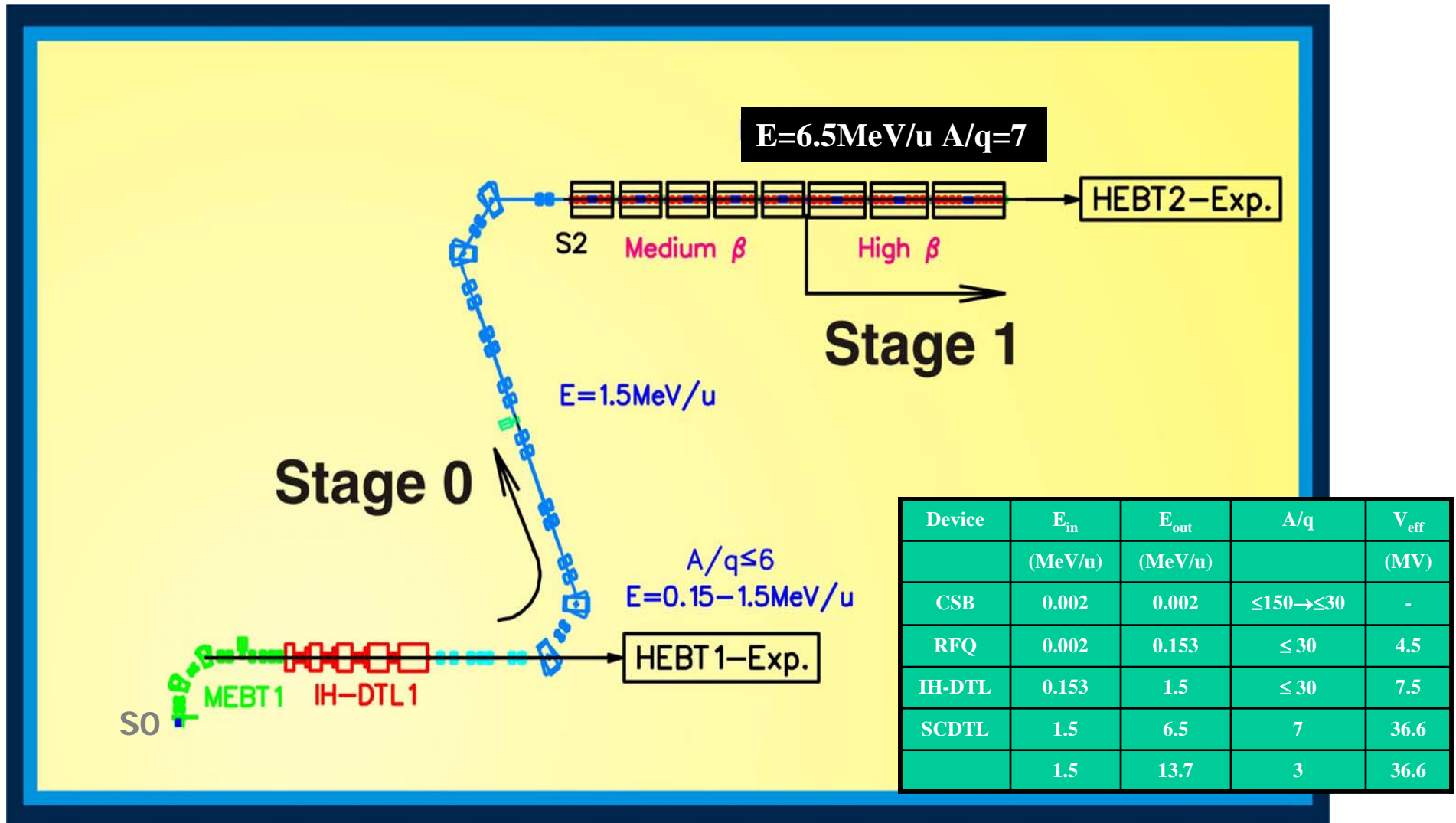
The ISAC - II Accelerator Floor



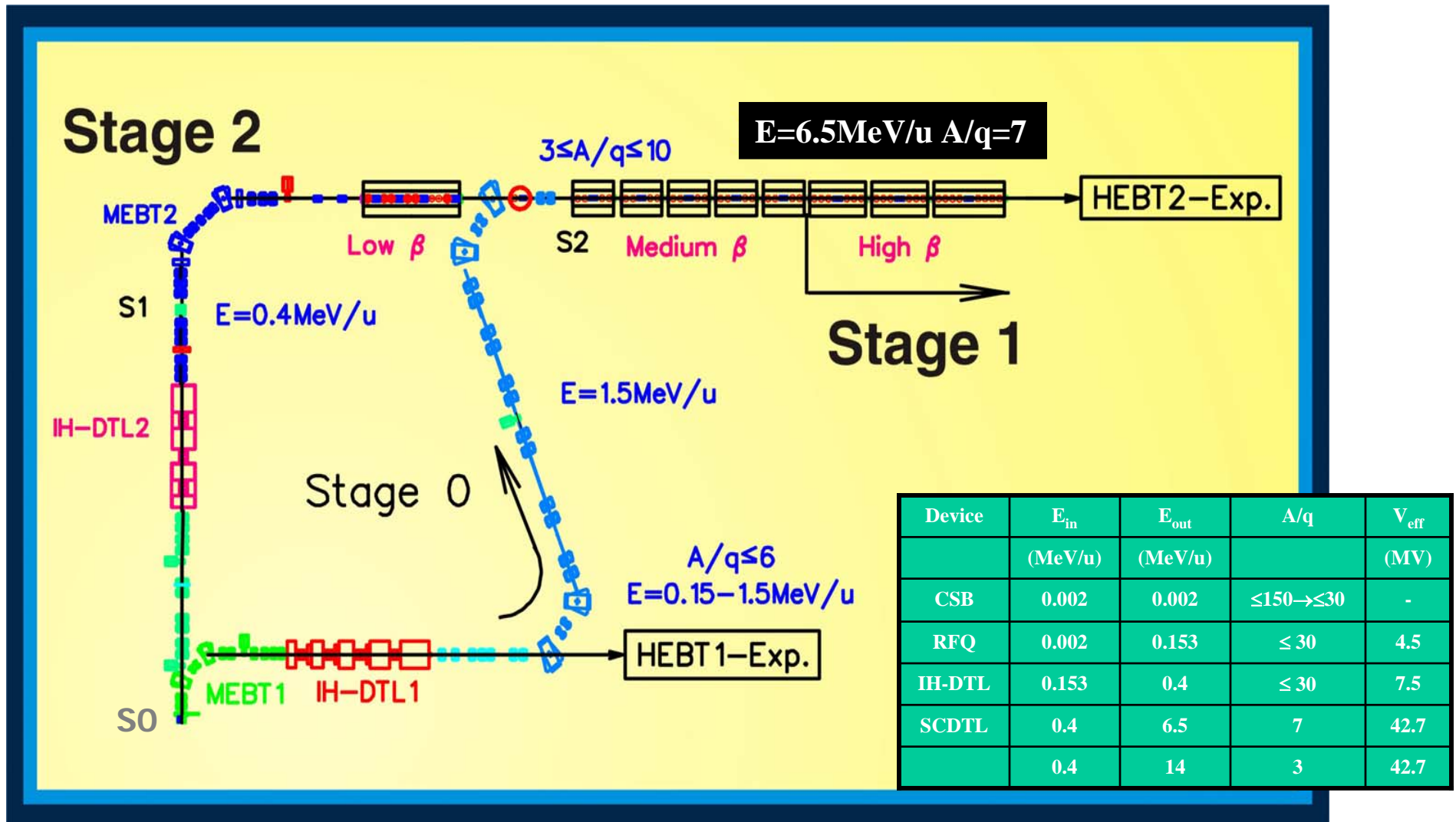
Stage 0 - 2006



Stage 1 - 2009



Stage 2 - 2011



EMMA

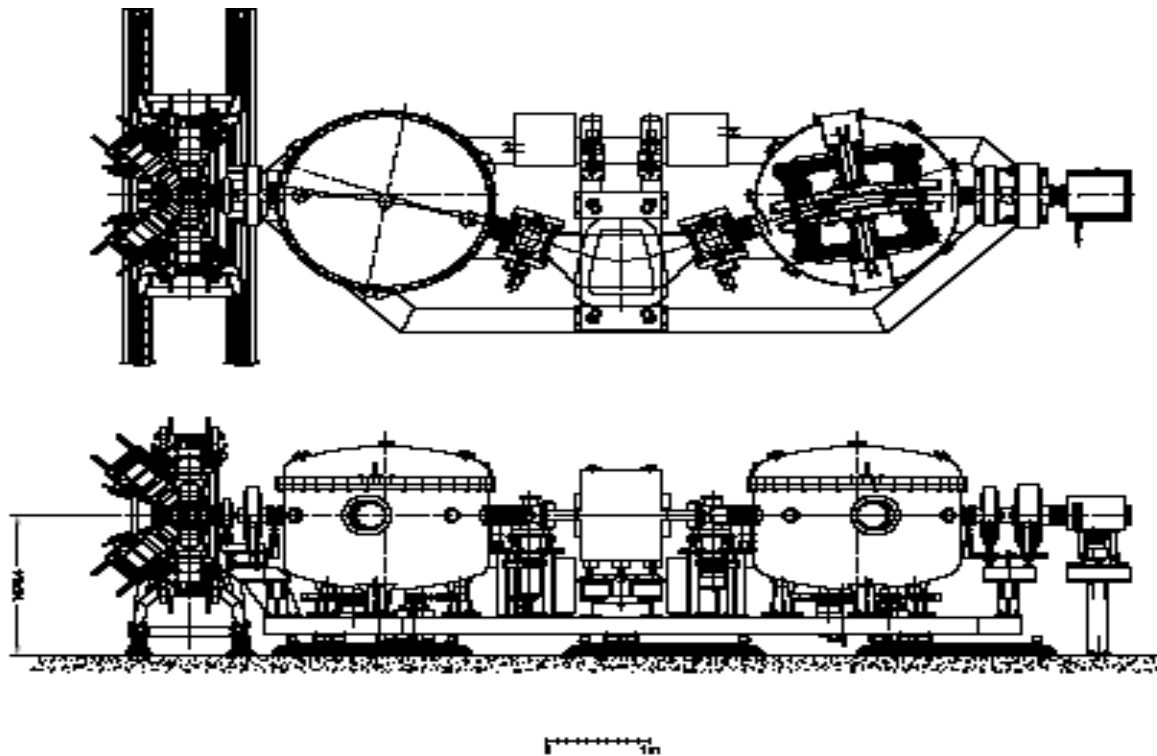
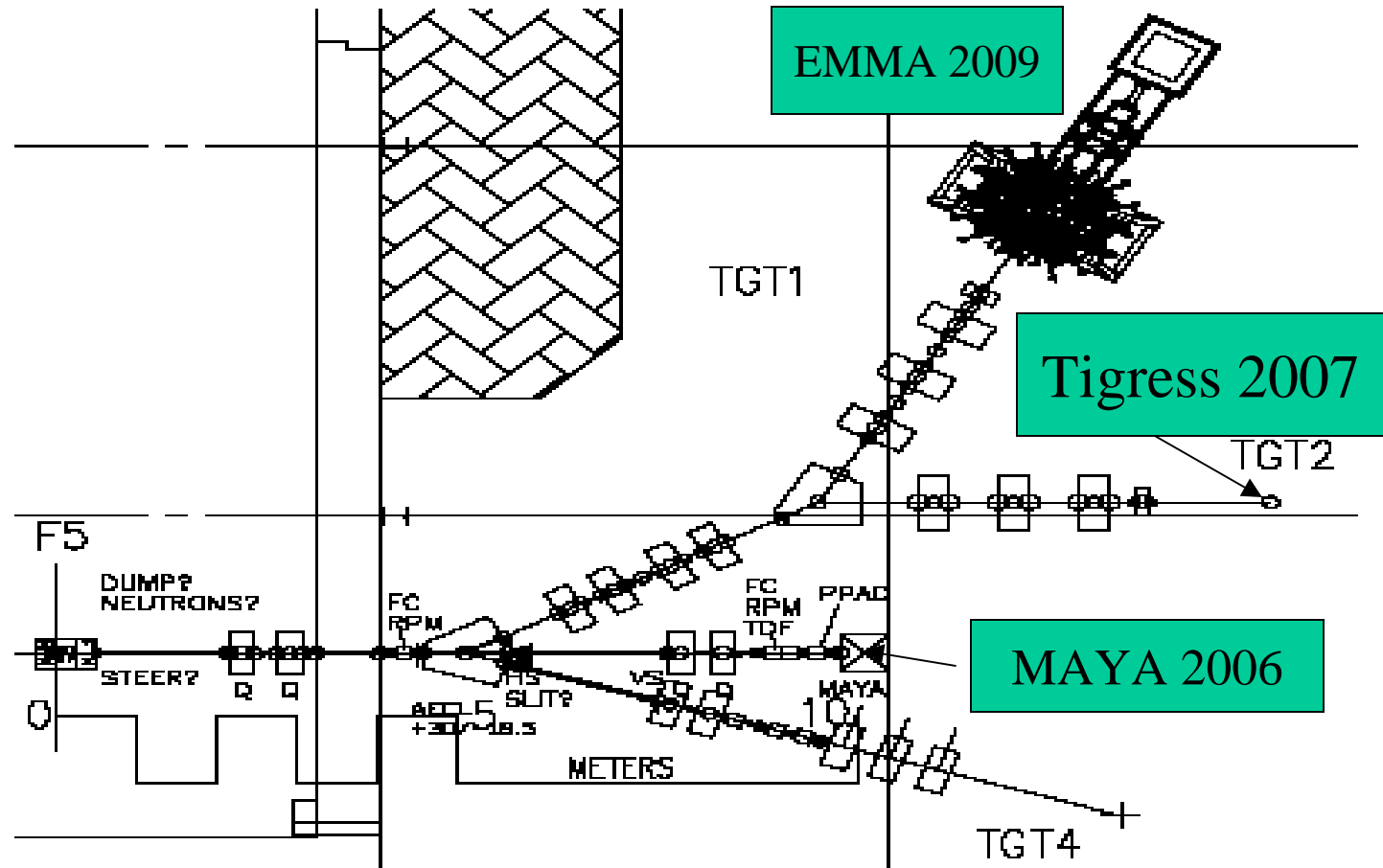


Figure 1: Schematic view of EMMA with TIGRESS surrounding the target position.

ISAC II Beamlines (new)

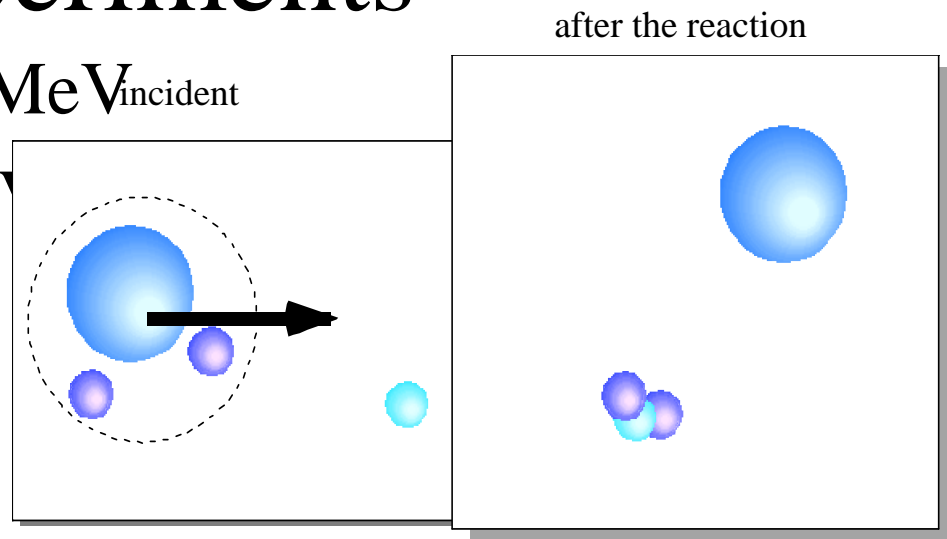


- E1055

Experiments

- $p(^{11}\text{Li}, ^9\text{Li}) t$ at $26.5 \text{ MeV}_{\text{incident}}$

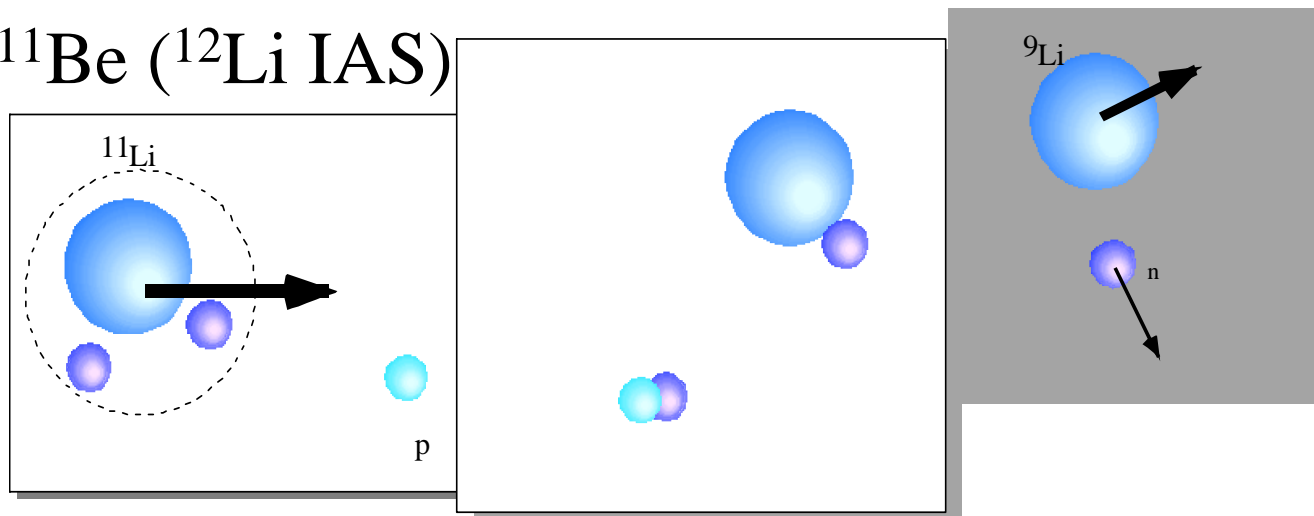
- $d(^9\text{Li}, ^9\text{Li}) d$ at 26 MeV



- E1078

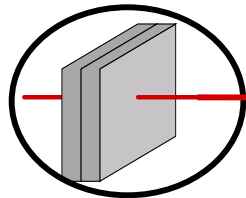
- $p(^{11}\text{Li}, d)^{10}\text{Li}$ at 49.5 MeV

- $p(^{11}\text{Li}, n)^{11}\text{Be}$ (^{12}Li IAS)

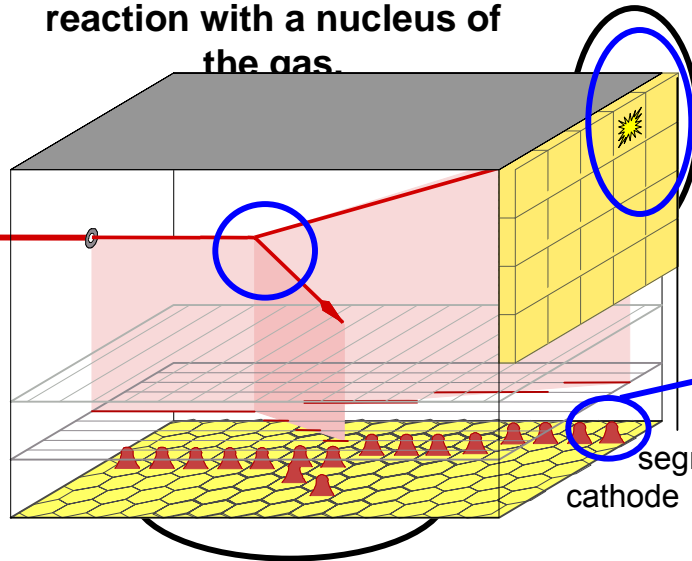


MAYA principle

there is a beam detector before MAYA, to start the DAQ.



the projectile makes reaction with a nucleus of the gas.



wall of Si detectors

the light scattered particles do not stop inside, and go forward to a wall made of 20 Si detectors, where they are stopped, and identified.

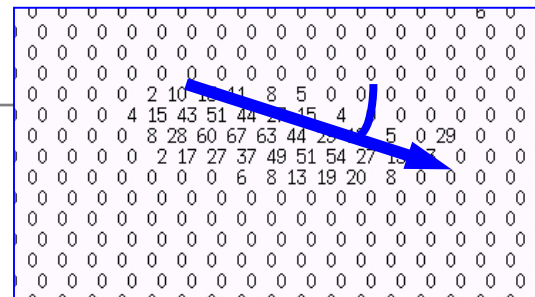
anode:
amplification
area.

segmented
cathode

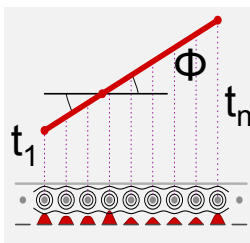


COG
over
3 axes

the product leaves enough energy to induce an image of its trajectory in the plane of the segmented cathode.



we measure the drift time up to each amplification wire. The angle of the reaction plane is calculated with these times.



ISAC II science program

- **Phase 1):** $A < 30$ (waiting for CSB operation)
 - $E < 4.5 \text{ MeV/n}$ (Medium β cavities only)
 - CNSC license to operate
 - Instruments deployment :
 - MAYA on loan from Ganil
 - Tigress 6 modules in 2007, 12 modules in 2009
 - Emma NSERC cash flow to 2010
 - Heracles
- **Phase 2)** CSB operational $A < 150$, $E < 4.5 \text{ MeV/u}$
- **Phase 3)** EMMA and ISAC II high beta cavities
, $E < 6.5 \text{ MeV/u}$

Nuclear Astrophysics program

- $^{26g}\text{Al}(p,\gamma)$ with DRAGON
- Up to $5 \times 10^9/\text{sec}$ ^{26g}Al delivered to Dragon (TRILIS)
- 79 μAmps operation for three weeks on high power SiC target
- ^{26m}Al and ^{26}Na contamination measured at the 3×10^{-5} and 3×10^{-6} level.

- 188 keV resonance seen: $\omega\gamma \sim 33 \pm 9 \mu\text{eV}$ (previous published upper limit 55)
- 188 keV resonance lower in energy by several keV
- Publication submitted
- Both effects are reducing the destruction of ^{26g}Al produced in Novae. Possible contribution from Novae sources.

Symmetries

- Search for non V-A interactions in weak interactions:
 - Scalar
 - V+A (right handed)
 - Tensor
 - Second class currents

TIGRESS HPGe Detector Status

- No.1: Prototype
 - No.4: Fully tested and accepted – Feb 15, 2006
 - No.3: - Apr 15, 2006
 - No.2: Arrived in Vancouver Feb 2006
 - No.5: Being Manufactured – delivery July 2006
 - No.6: Nov 2006
 - No.7: Mar 2007
-
- Remaining 6 detectors as 4 month intervals until Mar 2009

TITAN Facility status

Max-Planck-Institut für Kernphysik

McGill
Wien filter
($R=500$)

Arrived at TRIUMF April 06

Del Jul 06

Cooler trap for HCl
(to be built in Manitoba,
CFI grant received)

university of manitoba

Moved to ISAC March 06

TRIUMF **ISAC**

TITAN platform finished at ISAC

Beam development

- ISAC FEBIAD dev (P.Bricault):
 - Prototype passed endurance tests in March
 - Emittance/efficiency tests
 - New improved prototype to be tested on test stand in Jul/Aug
 - New target module and tray ready for online test in fall.
- ISAC ECR dev (N.Lescene):
- ISAC TRILIS dev (J.Lassen): Be, Ag
- Actinide target workshop (C.Morton)

ISAC Science: Plans

- **Schedule for 2006:**
 - High intensity running March 15th – Sep 6th
 - Mini-shutdown Sept 20th – Sept 28th
 - High Intensity running Sept 29th – Dec 6th
- **Goals:**
 - **First Tigress experiment in August**
 - **First Experiment with TITAN in fall**
 - **First experiment with ISAC II RIB**
- **Febiad ion source online**
 - ³⁴Ar beam
 - ¹⁸Ne beam
- **Actinide target development**
 - Target preparation lab ready
 - Project team leader hired (C.Morton)
 - International workshop held
 - Master plan promised to Users by July 25th 2006

Need for second RIB source

- Was asked for in the 2005-2010 Five Year Plan request but not funded
- Strong support from review committees
 - Crucial for beam development
- Will ask for second source in next plan
 - Delay till 2012 unfortunate.
 - Trying to negotiate an early start for civil construction
 - Exploring other source of funding (CFI)

ISAC at TRIUMF

