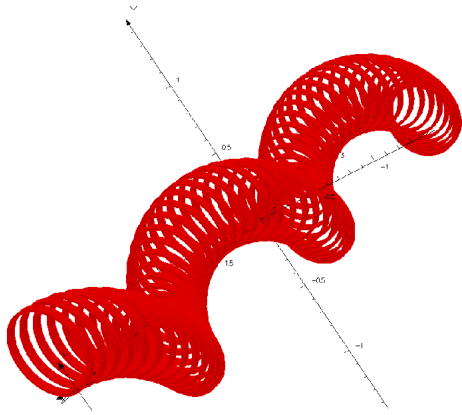


APC MCTF Experiment Group

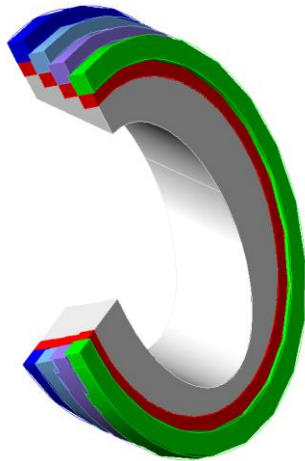
- Main goals for this year are largely focused on issues related to the helical cooling channel:
 - Develop and simulate a HCC design including RF cavities, with realistic engineering constraints
 - Test high pressure RF cavity with beam
 - Build and test a 4 coil HCC model magnet
- These goals aim towards defining a prototype HCC section to build and test in the next few years.



Helical Cooling Channel



“Helical solenoid” magnet
(V Kashikin)

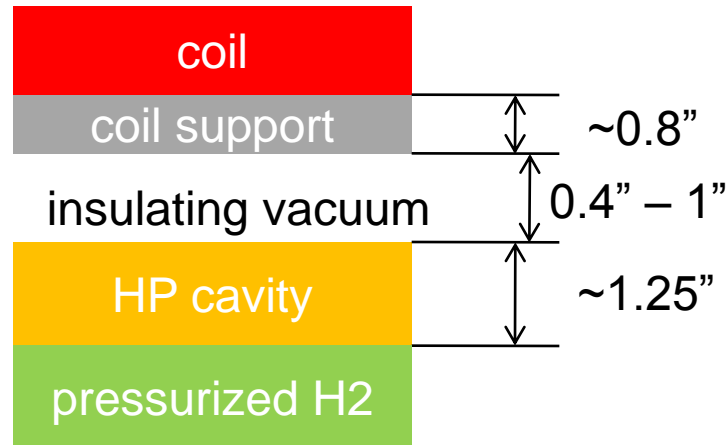


4 coil model magnet
(M Lamm), (V Kashikin)
APC+Muons Inc SBIR

How to include RF?

1. RF inside coils?
2. RF in between coils?
3. RF and HCC separate?

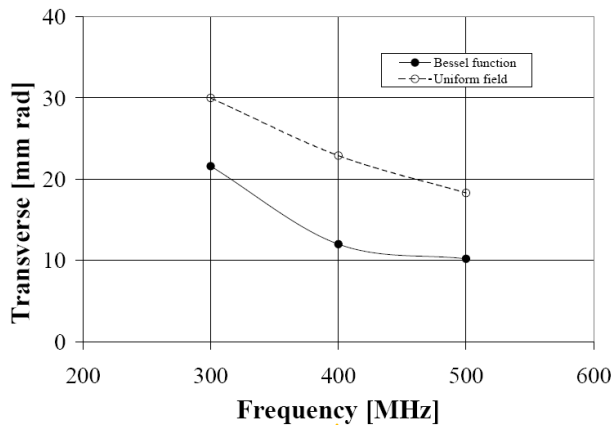
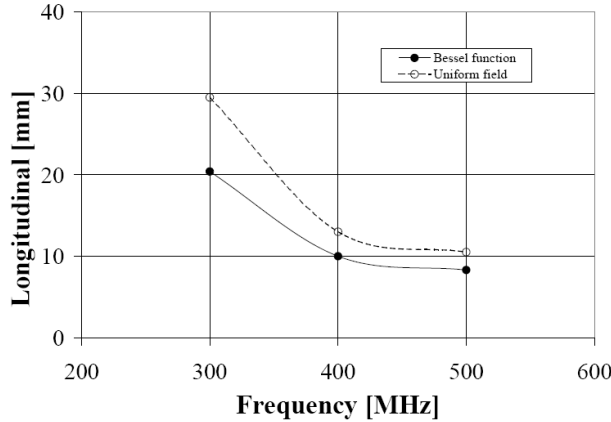
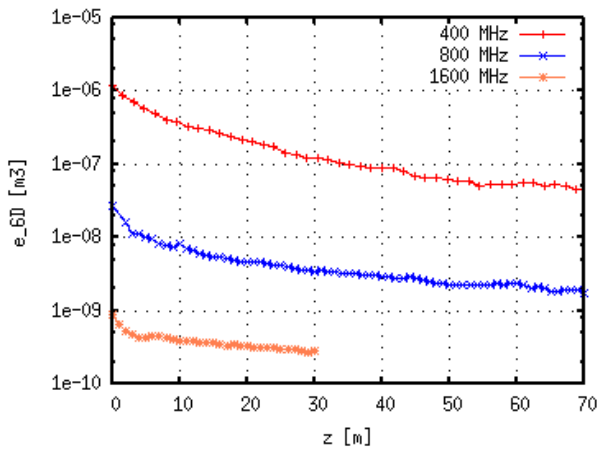
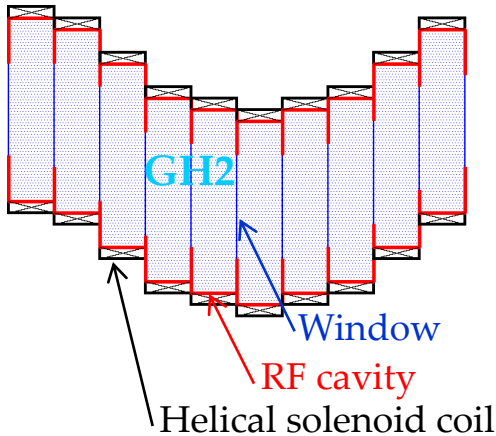
} How much space is needed in between?
 } How to match?



A Jansson, K Yonehara, V Kashikin, M Lamm, J Theilacker, A Klebaner, D Sun, A Lee, G Romanov, D Broemmelsiek, G Kutznetsov, A Shemyakin, ...



Type I HCC simulations



$$R_{\text{coil}} = R_{\text{cavity}}$$

- Early simulations ignored the geometric constraints on cavity size, then assumed $R_{\text{cavity}} = R_{\text{coil}}$

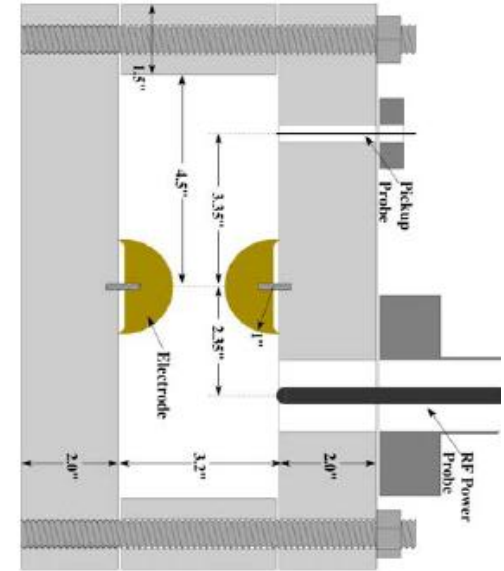
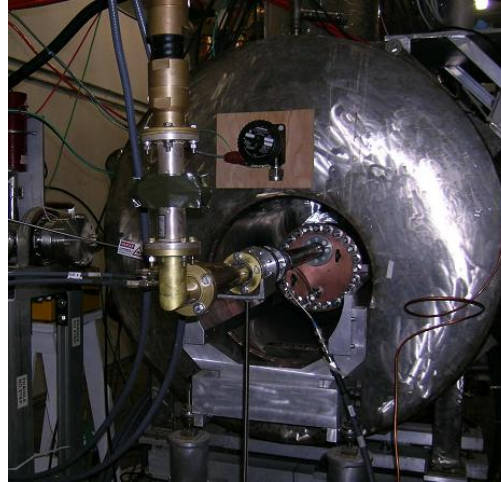
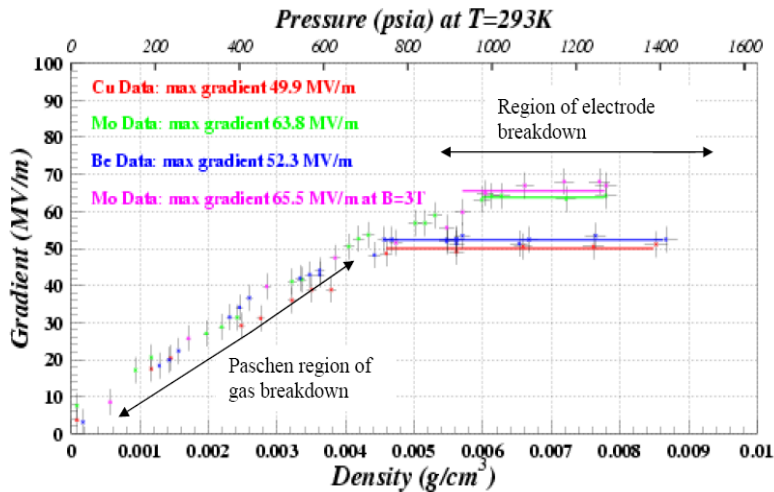
- Recent simulations indicate that R_{cavity} can be reduced further without much loss of acceptance!

- Need to explore the limits further

K Yonehara



Pressurized RF

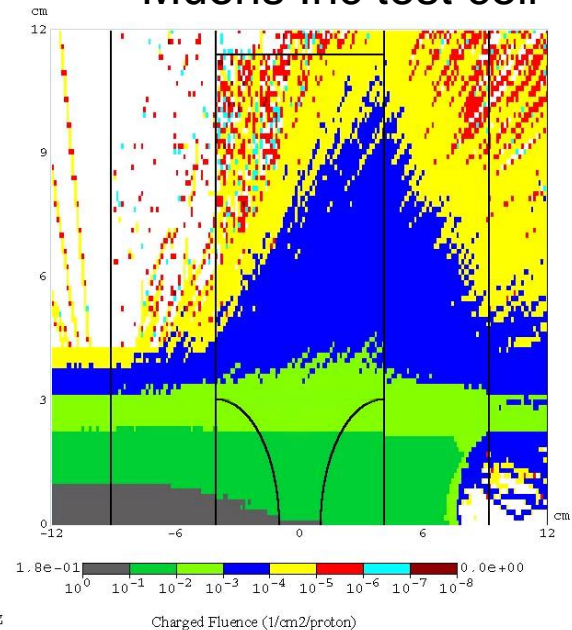


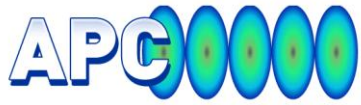
Muons Inc test cell

- Pressurized gas in RF cavities has been shown to suppress breakdown (even in presence of magnetic field) but it is unknown what happens in the presence of intense beam
- Helical Cooling channel uses HPRF
- Test with beam is a critical branch point to determine if a HCC is feasible.

*K Yonehara, A Moretti, (M Popovic),
+Muons Inc*

APC General Meeting 11 March





MTA Beamline

RF Power + Hydrogen safety + **Beam** needed.

MTA beam project in AD/External Beams
(C. Johnson), budget in APC (A. Bross)

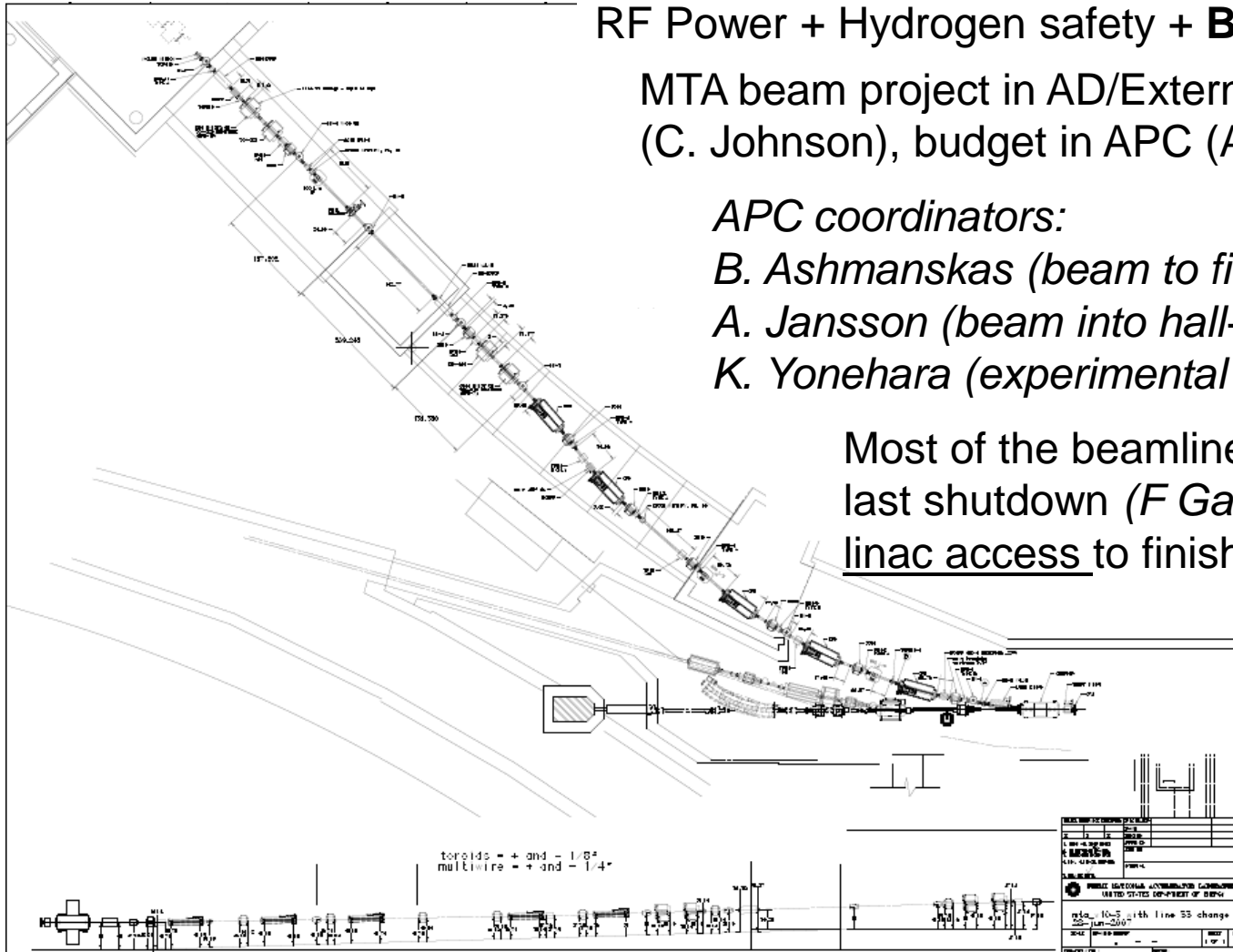
APC coordinators:

B. Ashmanskas (beam to first beam stop)

A. Jansson (beam into hall+ RF re-route)

K. Yonehara (experimental requirements)

Most of the beamline was installed
last shutdown (*F Garcia*), need
linac access to finish this year!





Other activities

- National HTS collaboration (FNAL, BNL, LBL, LANL, NHMFL, NIST) formed to study HTS material and insulation needed to build very high field solenoids. Formulating a proposal to DOE. A. Tollestrup
- Collider scenario and collider ring optics studies Y. Alexahin
- Capture, bunching and phase rotation. D. Neuffer, C Yoshikawa
- RF simulations and wall plug power estimate (N. Solyak), (V Yakovlev)
- Muon Instrumentation (M Hu)

