

ELENA Project

Possible TRIUMF Contributions

ELENA Meeting, September 28-29, 2011, CERN

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Rick Baartman

TRIUMF

TRIUMF, Vancouver, Canada

Canada's National Laboratory for
Particle and Nuclear Physics

Owned and operated by 17
Canadian Universities



On-site accelerator program

Radioactive Ion beams

Muons, Pions

Off-site program

ATLAS, ALPHA at CERN

T2K in Japan

**Strong Accelerator
collaboration with CERN**

Canadian contributions to the LHC

1995-2005 - \$41.5M

- PS conversion project – booster upgrade

→ AD intensity increase

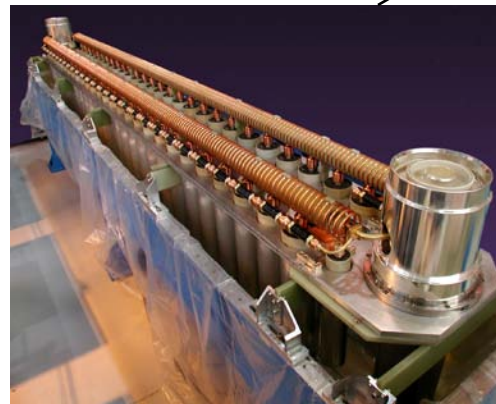
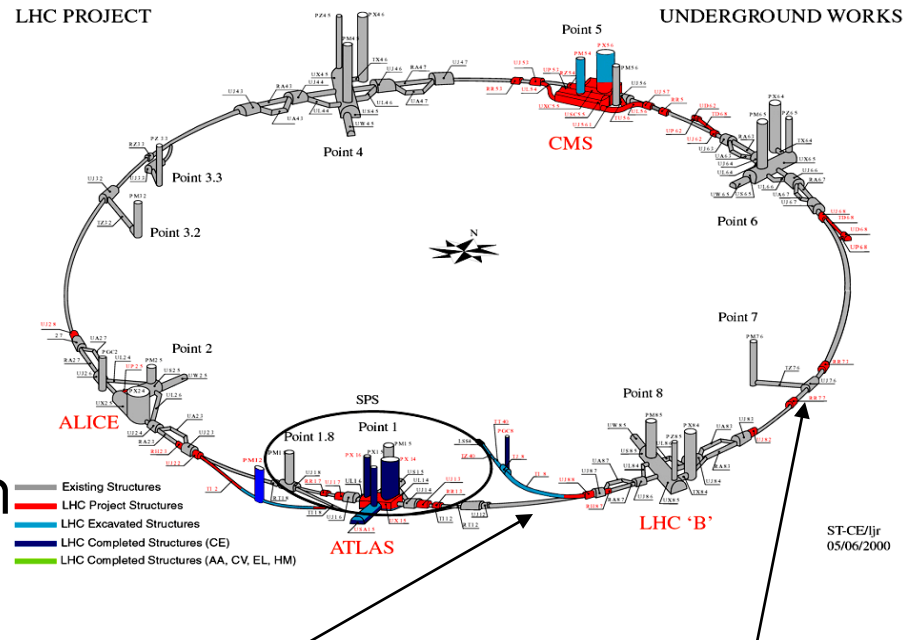
- 52 warm magnets – beam cleaning

- LHC kicker components

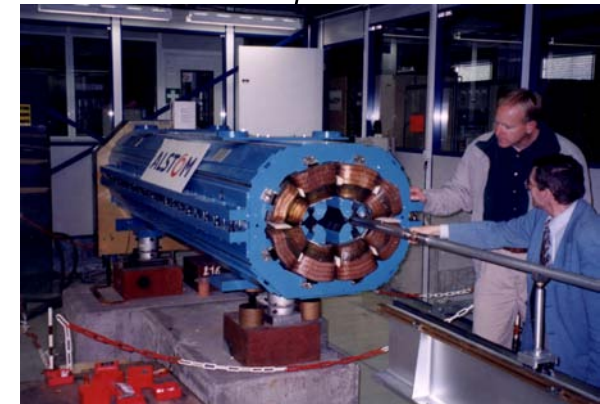
- beam instrumentation

Equipment delivered on time

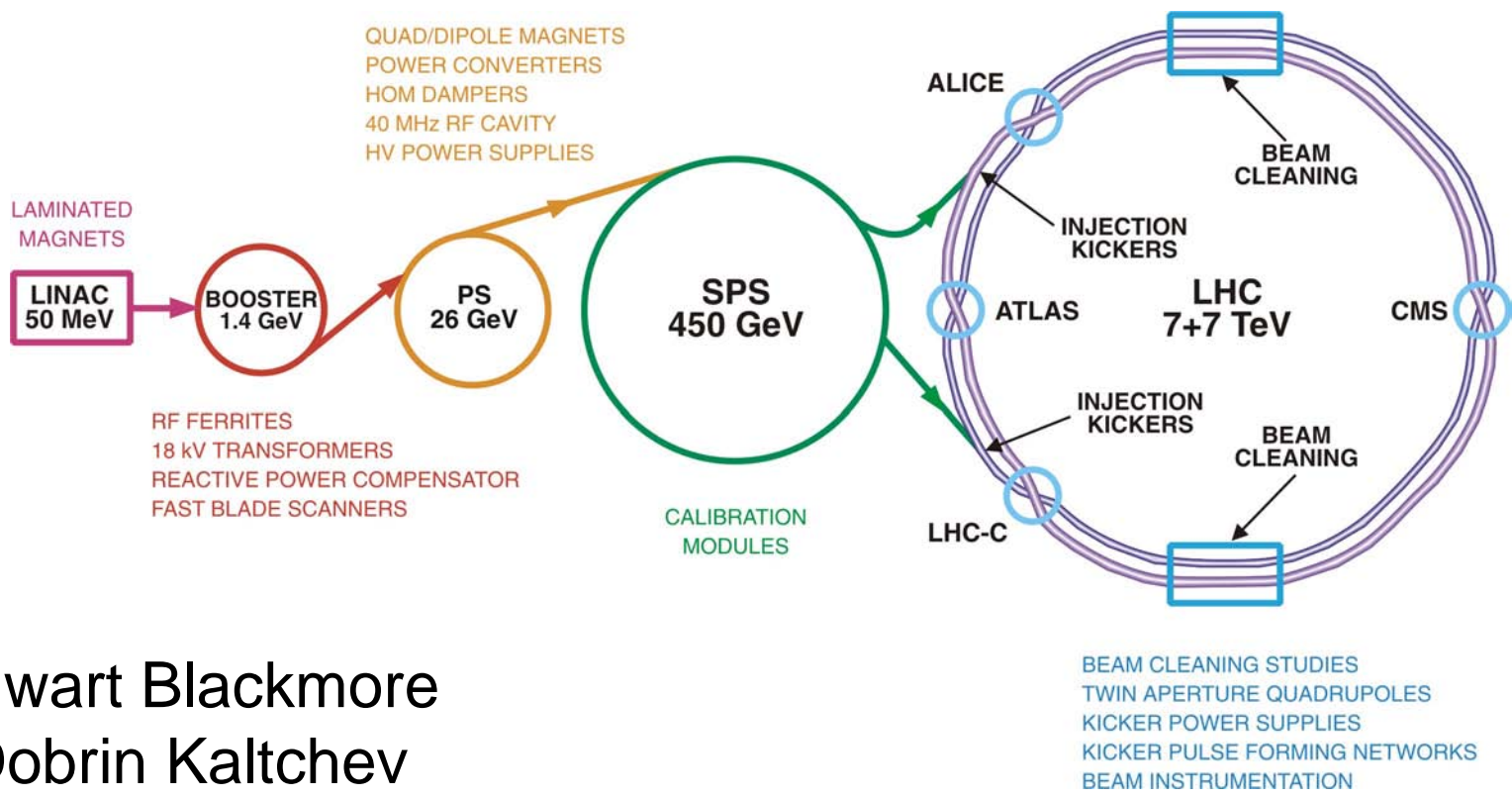
>80% Canadian industry involvement



PFNs for Kickers



Twin-Aperture Quads



Ewart Blackmore
 Dobrin Kaltchev
 Mike Barnes
 Fred Jones
 Daryl Bishop etc.

Currently many of our accelerator people are occupied with new SC Electron Linac project (ARIEL)

Possible TRIUMF Contributions

Electrostatic Beam lines

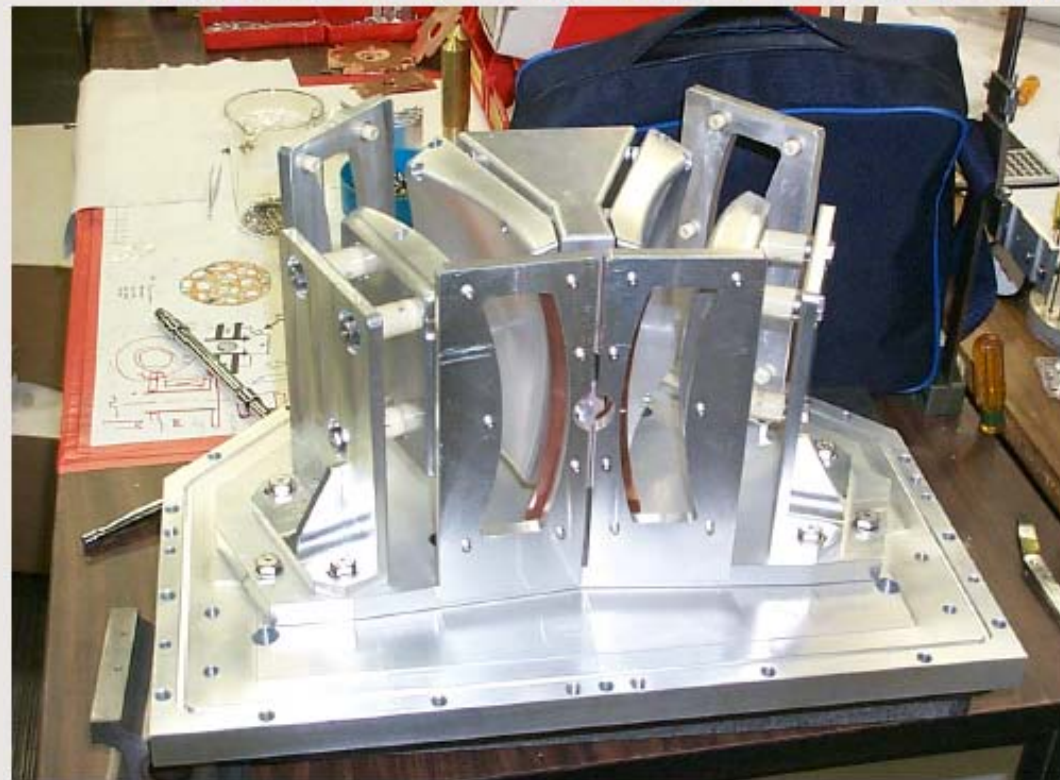
(as per request in 2005 by Tommy, Pavel):

Rick Baartman

(Group Leader, Beam Dynamics Group)

Electrostatic Optics at TRIUMF

- TRIUMF has designed and operated electrostatic lines for 40 years.
- The oldest is our 40m long, 300 keV H^- line, which consists of 80 quadrupoles and 6, 45° benders; in operation since 1974.
- Since 1997, we have been using our (5 to 60 keV/q) radioactive isotope (ISAC LEBT) beamlines/switchyards which contain over 100 quadrupoles, 25 unique spherical 45° benders, and 6 spherical 3-way benders.



3-way spherical bender during assembly.

E/S Optics at TRIUMF, further details

- Aberrations are well-understood, simple to mitigate (Baartman, 1997).
- Experimentally verified design acceptance of $>100 \pi\text{mm-mrad}$ for the ISAC LEBT beamlines.
- Clarified CERN-ISOLDE electrostatic optics (Baartman, 2001: CERN PS/OP/ Note 2002_085 <http://lin12.triumf.ca/text/2001ISOLDE/dn.pdf>)
- Experienced in handling stray magnetic field: from our cyclotron, transverse fields as large as 30 Gauss.



- Quadrupole, after some years of use.

Various mode of collaboration possible and welcome!