

Summary of PRISM-FFAG Muon to Electron Conversion Workshop

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Outline

- Workshop aims.
- Review of agenda.
- Search of cLFV and motivations for PRISM.
- PRISM-FFAG Task Force Initiative.

Workshop aims

The workshop aimed to cover the technological challenges in realising an FFAG based muon-to-electron conversion experiment which has a sensitivity of $<10^{-18}$.

Topics which were covered:

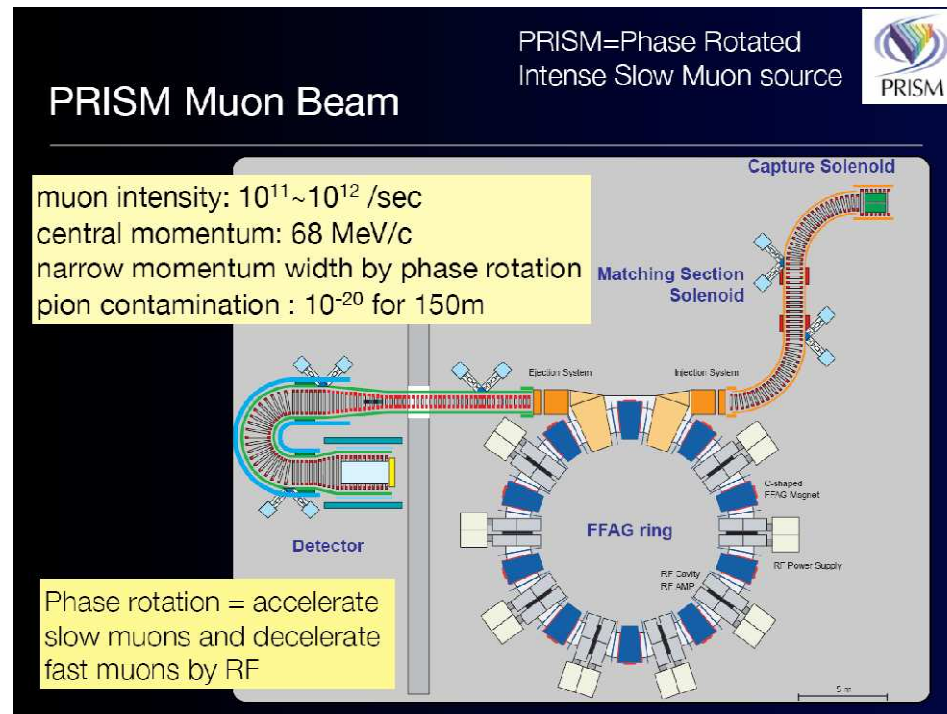
- Physics of Muon-to-Electron Conversion.
- Status of PRISM-FFAG.
- Beam dynamics, design and simulation studies for PRISM.
- Hardware developments for FFAG accelerators.
- Challenges of beam injection and extraction.
- Recent developments in FFAG accelerators.

Review of the workshop agenda

- After a warm welcome (P. Dornan), the introduction to physics of muon to electron conversion and COMET/PRISM experiments was presented by Y. Kuno and possible UK participation was discussed by Y. Uchida.
- The status of PRISM-FFAG R&D was introduced by A. Sato.
- Several new ideas in the field of FFAG accelerators and their possible applications to PRISM were presented:
 - the concept of advanced FFAG (Y. Mori/J.-B. Lagrange),
 - FFAG lattice with insertion (S. Machida),
 - new ideas for muon phase rotation (A. Sato),
 - beam extraction in PAMELA-FFAG (T. Yokoi).
- Hardware for FFAG accelerators was discussed:
 - for the case of EMMA machine and its commissioning (N. Bliss and B. Muratori),
 - MA cavities and dedicated RF for PRISM (C. Ohmori),
- Status of pulsed power at ISIS for injection and extraction was described (A. McFarland).
- Prospects for proton beam for PRISM was introduced by Y. Kuno.
- Several very interesting discussion sessions took place!

Search for cLFV and motivations for PRISM

- As charge lepton flavor violation (cLFV) is strongly suppressed in the Standard Model, its detection would be a clear signal for new physics!
- Search for cLFV is **complementary** to LHC.
- The $\mu^- + N(A,Z) \rightarrow e^- + N(A,Z)$ seems to be the best laboratory for cLFV.
- The background is dominated by beam, which can be improved.
- The COMET and Mu2e were proposed.
- The PRISM-FFAG ring was proposed for a next generation experiment in order to:
 - reduce** the muon beam energy spread by phase rotation,
 - purify** the muon beam in the storage ring.



The PRISM-FFAG Task Force Initiative

- The [PRISM-FFAG Task Force](#) was proposed and discussed during the workshop.
- The aim of the PRISM-FFAG Task Force is to address the technological challenges in realising an FFAG based muon-to-electron conversion experiment, but also to strengthen the R&D for muon accelerators in the context of the Neutrino Factory and future muon physics experiments.
- It was proposed to achieve a conceptual design of the PRISM machine at the end of 2010/beginning 2011.
- The following key areas of activity were identified and proposed to be covered within the Task Force:
 - the physics of muon to electron conversion,
 - proton source,
 - pion capture,
 - muon beam transport,
 - injection and extraction for PRISM-FFAG ring,
 - FFAG ring design including the search for a new improved version,
 - FFAG hardware R&D for RF system and injection/extraction kicker and septum magnets.
- The Task Force will use phone conferences and next PRISM-FFAG workshops were proposed.

Please join! j.pasternak@imperial.ac.uk