International Scoping Study
Accelerator Working Group:
Princeton Workshop
R&D Plans

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ISS Accelerator Group Workshop–Princeton
July 28, 2006

Proton Driver (1)

- Tracking studies, including errors, for each proposed scenario
  - need development of suitable tools, incl. space-charge effects
- Study losses and halo formation during acceleration
  - also at transfer locations
- Develop suitable chopper systems for linac front end
- Demonstrate required kickers and beam dump
  - repetition rate is an issue

Proton Driver (2)

- Develop electron model of proton FFAG ring
  - non-scaling and non-linear
  - design and fabricate model magnet(s)

- Study H^- injection
  - will foil burn up?
  - laser stripping
  - effects of blackbody radiation

Target (1)

- Complete MERIT experiment
- Benchmark production code predictions
- Examine buildup of Hg mist (π absorption)
- Study Pb-Bi alternative to Hg target
- Develop fully engineered solid-target (+ dump) concept
  - test in realistic experiment

Target (2)

- Test Superbeam horn at full field and repetition rate
  - expose to beam also
  - does radiation cause cavitation in cooling channels?
- Test C target in He atmosphere (complete ORNL work)
- Continue solid-target radiation studies

Front-End

- Complete MICE experiment
- Complete MUCOOL RF cavity tests with magnetic field
  - test effects of field parallel to windows also
- Develop and characterize LiH absorbers in standalone configuration and in conjunction with RF cavities
- Understand capture efficiency as f(σ_ℓ)
- Review options for more effective cooling channels
- Develop configuration with H_2-filled RF cavities

Acceleration (1)

- Develop baseline scenario for linac → RLAs → FFAGs
  - finalize energies for all systems
  - track end-to-end, with errors, including realistic transfers and matching
  - study required RF gymnastics (incl. amplitude and phase errors)
- Demonstrate technology for kicker and special magnets
- Experimentally determine maximum acceptable gradient for 201 MHz SCRF
- Simulate (scaling) FFAF-to-FFAG transfers
- Track scaling FFAGs with all errors
- Explore using scaling FFAG stage in base line (high f_{RF})

Acceleration (2)

- Develop and compare performance of optimized "all-RLA" scenario
- Test electron model of non-scaling FFAG ("EMMA")
- Check TOF vs. transverse amplitude in linac
- Check transfer line performance with positive chromaticity
- Study "harmonic jump" acceleration scheme (incl. errors)
  - design and test suitable RF cavity

Decay Ring

- Validate storage time via tracking with errors
- Demonstrate kicker and arc magnet technology
  - also diagnostics (do we need polarization measurements)
- Identify example sites
- Examine polarization issues for bowtie ring configuration
- Validate novel magnet concepts if needed

Concluding Comments

- We have done a good job at working together to arrive at a baseline configuration
- There is still a lot to be studied
- I am confident that the working relationship developed during the ISS will continue to the next phase of the work