**MEIC Tasks**

(June 4, 2014)

**System design**

* Electron transport line
* Electron ring update
* Electron ring (injection/top-off)
* Electron ring (equilibrium beam parameters, optimization)
* Pre-booster redesign (Figure-8 to race-track, insertion, dynamic aperture)
* Large booster design update (sufficient space, transitional gamma, integration of injection/ejection, RF and spin element, chromatic compensation, dynamic aperture)
* Ion source/linac “local owner”
* Ion beam transport line (between rings)
* Magnet specifications for all rings

**Special elements**

* Collimation
* Diagnostics
* Correctors
* Beam abort
* Feedback

**Beam dynamics and simulations**

* Space charge in the pre-booster/ion accumulation
* Space charge in all rings
* Beam-beam
* Single bunch instabilities
* Coupled bunch instabilities
* Ion trapping in the electron ring
* Electron clouds
* Scattering and beam/luminosity lifetime

**Interaction region**

* Chromatic compensation and dynamic aperture
* Crab crossing (design, simulations, effects on beam)
* Background

**Polarization**

* Electron beam polarization (spin matching, tracking simulation, spin rotators)
* Light ion beam polarization (spin controlling elements, tracking)

**Parameter space studies**

* Luminosity performance (energy/ion dependences)

**Accelerator R&D: ion beam formation and bunching**

* Accumulation, space charge
* Long to short bunch transformation, debunching-rebunching

**Accelerator R&D: beam synchronization**

* Chicane (location, design, diagnostic)
* Checking/mitigating issues associated to “running hares shooting” scheme
* Scheme for altering bunch repetition frequency

**Accelerator R&D: Bunched e-cooling experiment**

* Participating experiment at IMP, China (experiment design and simulation)

**Accelerator R&D: cooling and ERL-CC**

* Magnetized beam and integration
* E-source/Injector design and simulation
* ERL design and simulation
* Circulator ring
* Space charge in gun/ERL/CC, CSR in ERL-CC
* Suppressing micro-bunching instability
* Cooling channel

**Technology support: RF**

**Technology support: engineering**

* Magnet design
* Vacuum system
* Power supply
* Instrumentation

**Documentation**

* Tech notes
* Special reports (IR, cooling, polarization, instabilities)
* CDR