**Motivation:**

Muon Cooling - key step in the development of future accelerators: Neutrino Factory (NF) and Muon Collider. Benefits include:

- **NF:**
  - ultimate tool for precision $\nu$ studies
  - golden channel for $\nu$ measurements

- **Muon Collider:**
  - increased luminosity in muon collider
  - reduced site boundary radiation

**Cooling:**

Muons are produced as tertiary particles: $p + N \rightarrow \pi + X \rightarrow \mu + X$.

Created with large emittance – impractical for an accelerator.

“Cooling” reduces beam spread. Short muon lifetime, $\tau_\mu = 2.2 \mu s$, dictates ionization cooling as only feasible technique.

**MICE Subsystems**

- **Beamline**
- **Particle ID (PID)**
- **Environment**
- **Tracking Spectrometers**
  - spectrometer solenoids
  - fiber trackers
- **AFC**
  - absorbers
  - focusing coils
- **RFCC**
  - RF (acceleration)
  - coupling coils
- **Environment/Facilities**
- **Computing/Electronics**

**C&M Organization:**

- **Beamline**
- **Particle ID (PID)**
- **Environment**
- **Tracking Spectrometers**
- **AFC**
- **RFCC**
- **Environment/Facilities**
- **Computing/Electronics**

**Controls and Monitoring (C&M):**

Controls serve to:
- control/Opeate/Protect experimental equipment
- provide information between subsystems for inter-dependent operation
- properly sequence equipment operations
- ensure appropriate resource sharing of subsystems
- interface w/configuration database to systematically set-record configurations
- interface w/DAQ to ensure readiness/stability of equipment during running
- user interface to start/stop runs

Monitoring serves to:
- provide feedback for control sequencing
- give early notification of potential equipment failures
- provide software interlocks to protect equipment
- protect data quality
- archive pertinent data which may later be needed for debugging
- archive pertinent data which may later be needed in data analysis corrections

**Higher Level C&M:**

- RunControl: Integrates
  - equipment IOCs
  - DAQ
  - target DAQ
  - MICEStates
  - DAQMon
  - CDB

**AutoSMS:**

- Used as poor-man's auto-dialer
- Makes use of email to SMS gateway

**MICE States:**

- transition to state
- read CDB for subsystem/state
- set PV ALH fields/archive configuration
- perform checks on software interlocks
- perform checks for errors
- perform checks for new transition

**MICE Tracking/Cooling Channel:**

- use EPICS 5NL
- to be used in all major subsystems
- sets PV fields depending on state
- sets archiver features
- sets AutoSMS flags
- presently used in SS tests

**MICE Beamline**

Commissioned summer 2010