Observations of 2P/Encke and C/2012 S1 (ISON)
Mercury Dual Imaging System (MDIS)

- Wide-angle camera (10.5° × 10.5° FOV)
  - ~650 km/pixel at closest approach to Encke
  - ~6500 km/pixel at closest approach to ISON
  - Overall emission using clear filter at 700 nm (600 nm bandwidth)
  - Possible C₂ band emission using filter at 559.2 nm (4.6 nm bandwidth)

- Narrow-angle camera (1.5° × 1.5° FOV)
  - ~90 km/pixel at closest approach to Encke
  - ~900 km/pixel at closest approach to ISON
  - One “filter” (750 nm center, 100 nm bandwidth)
    - Possible nucleus imaging of Encke?

- Pivot allows imaging over large period of time
  - Note that figures only show times for imaging of the nucleus – any tail may be observed for longer periods of time.
Observations of 2P/Encke and C/2012 S1 (ISON)

Mercury Atmospheric and Surface Composition Spectrometer (MASCS)

• Ultraviolet and Visible Spectrometer (scanning monochromator)
  – Point spectrometer with two slit sizes (0.04° × 1° or 0.04° × 0.05°)
  – Three PMTs (two operating at same time)
    ➢ FUV (115-190 nm at 0.3 nm spectral resolution)
    ➢ MUV (160-320 nm at 0.7 nm spectral resolution)
    ➢ VIS (250-600 nm at 0.6 nm spectral resolution)
  – Some spatial information can be obtained via pushbroom scanning of FOV

• Visible and Infrared Spectrograph (array spectrograph, 0.023° circular FOV)
  – VIS channel (300-1050 nm at 4.7 nm spectral resolution)
  – NIR channel (850-1450 nm at 4.7 nm spectral resolution)

• Geometry/instrument sensitivity/comet conditions for Encke similar to those for previous IUE observations
• Expected productivity of ISON balances poorer geometry to large extent
X-Ray Spectrometer (XRS)
- Energy range of 1-10 keV
  - Measures low-energy lines from Mg, Al, Si, S, Ca, Ti, Fe
- Relatively large FOV (12° full-angle hexagonal)
- Separate solar unit measures flux from Sun for calibration
- Regular calibrations against Cas A
- X-ray emission from Encke should be at levels that are easily detectable based on previous Chandra observations
  - Emission from ISON less so but still expect decent signal

Energetic Particle and Plasma Spectrometer (EPPS)
- If ion tail is swept in the appropriate direction, EPPS can measure both ions (50 eV to 20 keV, up to 40 M/Q) and electrons (25 keV to 1 MeV).