Data Simulator Overview

- GOAL
  - Generate artificially generated observations representative of data likely to be encountered once operational
- THE DATA SIMULATOR TEAM
  - Hugh Harris, Photometry
  - Stephen Levine, Utility outfielder
  - Jeff Munn, Sky to Focal Plane
  - Dave Monet, Focal Plane to Pixels
  - Jeff Pier, Leader, ACS Simulator Liaison

Data Simulator Overview (cont'd)

- IMPLEMENTATION
- Inputs:
  1. Spacecraft attitude and orbit data from Tae Lim's ACS Simulator
  2. PSFs from LM
  3. Input Catalog from Sean Urban
  4. Focal Plane Model

Data Simulator Overview (cont'd)

- IMPLEMENTATION (CONT'D)

– C code written by the Data Simulator Team

1. Use ACS simulator to generate s/c attitude info with nutation and perturbations.
2. Predict fov's of apertures from s/c attitude
3. Determine catalog tiles/stars in fov
4. Project stars onto the focal plane u,v using PSFs and optical distortions
5. Distribute stellar photons onto CCD pixels, add CCD noise, non-linearities, CTI
6. Accumulate DNs

– Outputs:

1. Postage Stamps

Data Simulator Overview (cont'd)

- PROTOTYPE
  - Deliverable due 01 March 2001
  - Simple spinning spacecraft, ignores perturbations
  - Assumes rigid inertial star catalog
  - Ignores PSF asymmetries and optical distortions
  - Ignores problems in CCDs and CCD electronics
  - Ignores thermal variations of instrument
  - Generates centroids (not postage stamps)

Data Simulator Overview (cont'd)

- CURRENT STATUS
  - Covered in detail by following presentations

- POST-PROTOTYPE
  - Incorporate ACS Simulator with nutation, perturbations, jitter
  - Incorporate PSFs and optical distortions
  - Incorporate thermal effects (including basic angle change)
  - Incorporate CCD imperfections
  - Incorporate CCD electronics imperfections

- ISSUE

  What perturbations should the Data Simulator Team be addressing first???