

Discussion Topics

- What data do you need to collect?
 - Not just flatfields and darks - point source illuminated data! (Tinney)
 - 1. Astrometry
 - 2. Sub-pixel PSF performance
 - 3. Brighter-Fatter via measuring things getting fatter as they get brighter (not from flat fields)
 - Projecting point sources on detectors like at JPL's Precision Projector Laboratory (Andrés)
 - Projector at Davis too, with mask (e.g., "mask of the universe" with stars and galaxies, made by some company in Nevada)
 - Once you have the characterization data, what do you do?
- What is the role of low-cost COTS sensors for astronomy?
 - Radiation hardness and qualification for space?
 - Anyone know of cheap (<\$100k) cryogenic IR sensors for things like slit viewing cameras?
 - Anyone know much about SWIR [Sony IMX 992](#)?
- What is the role of high-cost custom sensors for astronomy?
- How do you verify the detector characterization once in space and over time?
 - How do we keep a tight loop between detector characterization and pipeline/science teams?
 - B.J. Rauscher/NASA-GSFC: I find the key is having switch-hitters who participate both in the science and technical contexts. You need detector experts participating in the science groups. You need scientists (even theorists with a practical side) working with the detector characterization data. It's all about the people...

- Regarding the persistence observed in CMOS detectors, can it be determined where within the pixel this occurs? There are no parallel transfers as there are in CCDs that can help discriminate between bulk and surface traps. Because there's more persistence signal the more collected signal, can we tell if it's an infinite number of traps
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- available in the pixel (and finite probability to trap per conversion) or does the flow path change because something gets charged up?
- For better characterizing brighter-fatter effect it would be useful to have an OTS fringe projector with laser source to project a theoretically known modulation function in the illumination (and well controlled contrast & polarization). Say we'd like to project pattern periods just a few pixels wide. Should be simple to set up, has anyone made such a thing?
- Ajay: Why don't we often see errorbars on QE curves? I would think we need to propagate these errors for the science analysis.
- Alex Drlica-Wagner: What new characterization tasks and capabilities are possible with photon-resolving/quantized CCD sensors? B.J. Rauscher: Related, what new effects are we going to see (and not like) that previously were buried in the read noise.
 - (Andrés) Clock-induced charge?
 - (D Egaña) We do believe we see secondary photons from cosmics.
 - (Alex) We need to start being more precise with what we call "dark current". Need to learn from the dark matter folks.
- Dan W - can we make a case for resources to do more detector physics unrelated directly to mission/project requirements (i.e. trap investigations, DLTS, TCT etc), do people think this is a good idea?

At workshops such as these, can we have more time to discuss our common problems and needs? Perhaps something like breakout

discussion sessions for addressing common issues? (Thus connecting junior and senior researchers working on the same problem for different missions?)