Panoptic Astronomical Networked Observatories for a Public Transiting Exoplanets Survey
Short intro about my “day” job

I develop an instrument to image exoplanets on the Subaru Telescope

A few facts about our instrument:

- It has a small field of view, about 1 arcsecond (Neptune does not fit in our widest field camera)
- It costs > $10M
- It uses bleeding edge technologies, including advanced cameras (for example, a superconducting camera running at 0.1 K temperature)
- It is very complex and delicate. Only 5 people in the world can run it … and it takes these 5 people to run it
Earlier prototypes (not ours)

Omnibot (1985)

Johnny 5 (1986)

Wall-E (2008)
Final design
Example image (Cygnus field):
>100,000 stars in a single image

Transit Field #1 (in Cygnus), camera 2 (Sept 11, 2012 UT)
Test on star HD54743 (V=9.35)
1 mn cadence
Test on star HD54743 (V=9.35)
1 mn cadence
Test on star HD54743 (V=9.35)  
1 mn cadence

<table>
<thead>
<tr>
<th>Error term</th>
<th>R channel</th>
<th>G channel</th>
<th>B channel</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmospheric Scintillation</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>mV=9.35, includes background contribution (bright time, r=40arcsec mask)</td>
</tr>
<tr>
<td>Photon Noise</td>
<td>2.79%</td>
<td>1.00%</td>
<td>2.24%</td>
<td></td>
</tr>
<tr>
<td>Readout Noise</td>
<td>0.40%</td>
<td>0.23%</td>
<td>0.71%</td>
<td></td>
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<tr>
<td>Flat field error</td>
<td>0.5%</td>
<td>0.4%</td>
<td>0.5%</td>
<td>Error term irrelevant with good tracking</td>
</tr>
<tr>
<td>Total (expected)</td>
<td>2.88%</td>
<td>1.14%</td>
<td>2.42%</td>
<td></td>
</tr>
<tr>
<td>Achieved</td>
<td>2.48%</td>
<td>2.04%</td>
<td>3.51%</td>
<td></td>
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</tbody>
</table>
PANOPTES will also take pretty images
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Comet Lovejoy and Geminid meteor - single 10 minute exposure
More info, how to join PANOPTES

Project website: www.projectpanoptes.org
Software: https://github.com/panoptes
Joining request: info@projectpanoptes.org