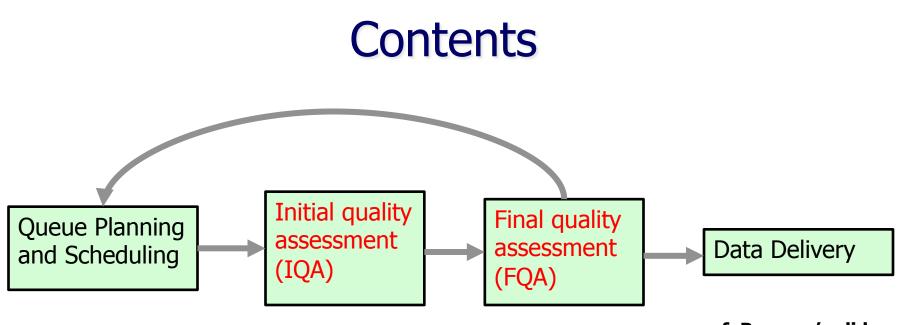
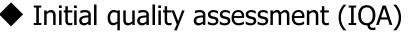
## Quality Assessment (IQA & FQA)

#### HSC Queue-Mode Workshop June 16<sup>th</sup>, 2015

Fumiaki Nakata Subaru Telescope National Astronomical Observatory of Japan



cf. Pyo-san's slide



Check quality of HSC data during observation

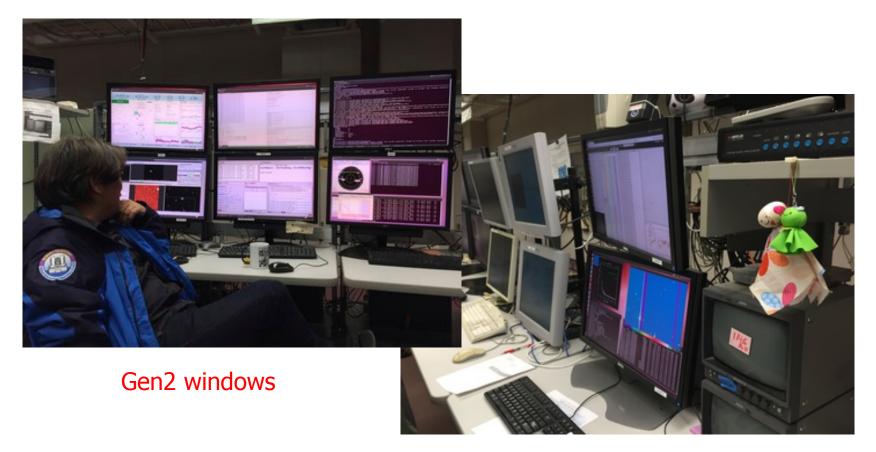
Done by Queue Observer

```
Final quality assessment (FQA)
```

Double check in the next day time

Done by HSC SS (who is not observing)

#### Observation



Ana (checking data qualtiy)

We watch many windows for proceeding the observation for checking

- Telescope status
- Instrument (HSC) status ...

## Quality Assessment (QA)

#### For obtaining good data continuously.

 $\bullet$  To maintain the telescope and instruments is also important.

 $\bullet$  Checking the indicators of data quality.

Seeing, elongation, transparency...

#### Merits of QA

 $\bullet$  Reducing the inefficiency, and improving the observation.

For queue and remote observations, where PIs are not at the site, QA is important to determine whether the PIs' demands are satisfied.



Useful for searching adequate archive data for users

## Initial Quality Assessment (IQA)

#### Check quality of HSC data during observation

#### ◆ Zview

- seeing, elongation
- We can check quickly, but roughly.

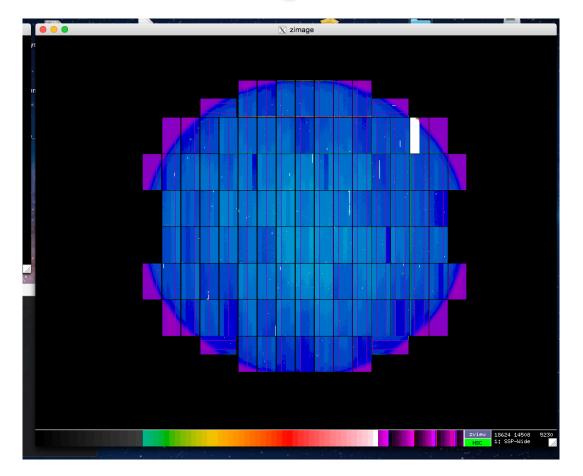
#### On-site analysis system

- seeing, transparency, reduced image
- ◆ It takes a few minutes to reduce data.
- ◆ We can check more exactly.

#### ◆ Etc.

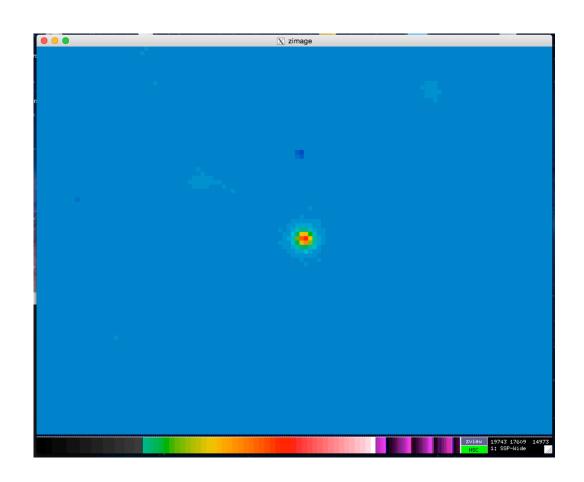
- Cloud, Cirrus
- Moon phase and distance
- Airmass

#### Initial QA: zview

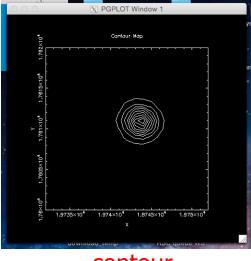


Although the images shown by zview are not reduced, we can check immediately after exposures.

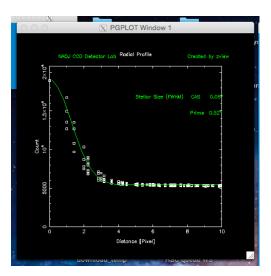
## Initial QA: zview



If elongations of stellar images are seen, we may need to adjust the telescope focus.



contour



profile (seeing)

## Initial QA: On-site analysis system

HSC Monitor ×				Fumi
C n <u>k</u> <u>https://hsca-web01.subaru</u>	nao.ac.jp/obslog/#%7B%22query%	522%3A%7B%22text_input%22%3A	%22order%3A%20'datetime_obs	%20desc'%22%2C%22date_from%22% 🚖 Q 🔀
📄 お気に入り 🛛 🚺 Hyper Suprime-Cam 📄 HSC Mo	onitor 🛛 🔚 Munin :: localhost :: 💷 阳 hsc	survey / FrontPag 🛛 🕘 Subaru Telescope	8 GMail 8 Google+ 🕨 YouTu	be 🕂 Google マップ 🚦 Outlook.com - qqd2 🛛 🛧 Bookmarl
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visit frame-id date_obs HST filter object	ct exptime altitude inst-pa seeing magzero sk	vlevel transp focval best_Z pinting id	header ellip fwhm QA $\rho \rightarrow \sigma \Delta \pi \rightarrow \sigma$	T note
31160 object231 2015-05-22 03:20:53.305 HSC-R HETDEX			$\rho \Rightarrow \delta \Delta \# \delta \Delta \# \Rightarrow \Rightarrow$	е 🗌
31158 object230 2015-05-22 03:18:04.427 HSC-R HETDEX	120.00 34.36 0.00 0.75 27.51 1305	.15 0.86 3.72 3.67 H-02-037-01-00003	$\rho \Rightarrow \delta \Delta \# \delta \Delta \# \Rightarrow \Rightarrow$	е 🗌
31156 object229 2015-05-22 03:15:24.227 HSC-R HETDEX	120.00 34.83 0.00 0.78 27.54 1299	.40 0.87 3.72 3.84 H-02-037-01-00002	$\rho \Rightarrow \delta \Delta \# \delta \Delta \# \Rightarrow \Rightarrow$	е
31154 object228 2015-05-22 03:12:44.799 HSC-R HETDEX	120.00 35.23 0.00 0.73 27.54 1295	.55 0.87 3.72 3.73 H-02-037-01-00001	$\rho \ \Rightarrow \ \delta \ \Delta \ \# \ \delta \ \Delta \ \# \ \Rightarrow \ \Rightarrow \ \Rightarrow$	е
31152 object227 2015-05-22 03:11:34.692 HSC-R HETDEX	30.00 <mark>35.45</mark> 0.00 0.76 <mark>27.55</mark> 324.0	08 0.88 3.72 3.71 H-02-037-01-00000	$\rho \ \Rightarrow \ \delta \ \Delta \ \# \ \delta \ \Delta \ \# \ \Rightarrow \ \Rightarrow \ \Rightarrow$	e 🗌
31150 object226 2015-05-22 03:08:44.687 HSC-R HETDEX	120.00 <b>34.77</b> 0.00 0.73 <b>27.54</b> 1322	.35 0.88 3.72 3.67 H-02-038-01-00003	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	е
1148 object225 2015-05-22 03:06:03.605 HSC-R HETDEX	120.00 35.24 0.00 0.75 27.54 1315	.75 0.88 3.72 3.68 H-02-038-01-00002	$\rho \ \Rightarrow \ \delta \ \Delta \ \# \ \delta \ \Delta \ \# \ \Rightarrow \ \Rightarrow \ \Rightarrow$	е
1146 object224 2015-05-22 03:03:23.240 HSC-R HETDEX	120.00 35.64 0.00 0.75 27.55 1318	.43 0.88 3.72 3.74 H-02-038-01-00001	$\rho \ \Rightarrow \ \delta \ \Delta \ \# \ \delta \ \Delta \ \# \ \Rightarrow \ \Rightarrow \ \Rightarrow$	e
1144 object223 2015-05-22 03:02:12.491 HSC-R HETDEX	30.00 <mark>35.85</mark> 0.00 0.82 <mark>27.54</mark> 329.9	0 0.88 3.72 3.70 H-02-038-01-00000	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	е 🗌
1142 object222 2015-05-22 02:59:23.257 HSC-R HETDEX	120.00 <mark>37.07</mark> 0.00 0.73 <mark>27.52</mark> 1295	.42 0.87 3.72 3.77 H-02-072-01-00003	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow 0.2cm$	е 🗆
1140 object221 2015-05-22 02:56:43.440 HSC-R HETDEX	120.00 37.53 0.00 0.78 27.53 1274	.84 0.87 3.72 3.67 H-02-072-01-00002	$\rho \ \Rightarrow \ \delta \ \Delta \ \# \ \delta \ \Delta \ \# \ \Rightarrow \ \Rightarrow \ \Rightarrow$	е 🔲
1138 object220 2015-05-22 02:54:02.552 HSC-R HETDEX	120.00 <mark>37.92</mark> 0.00 0.79 <mark>27.53</mark> 1255	.69 0.87 3.72 3.86 H-02-072-01-00001	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	е 🔲
1136 object219 2015-05-22 02:52:52.691 HSC-R HETDEX	30.00 38.13 0.00 0.71 27.54 314.5	6 0.87 3.72 <mark>3.76</mark> H-02-072-01-00000	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	е 🔲
1134 object218 2015-05-22 02:50:01.127 HSC-R HETDEX	120.00 <mark>38.12</mark> 0.00 0.70 <mark>27.50</mark> 1273	.21 0.84 3.72 3.69 H-02-107-01-00003	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	е 🗆
1132 object217 2015-05-22 02:47:19.796 HSC-R HETDEX	120.00 <mark>38.57</mark> 0.00 0.68 <mark>27.48</mark> 1262	.74 0.83 3.72 3.72 H-02-107-01-00002	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	е
1130 object216 2015-05-22 02:44:38.237 HSC-R HETDEX	120.00 38.95 0.00 0.73 27.50 1240	.66 0.84 3.72 3.71 H-02-107-01-00001	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \eth \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \eth \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	e 🗐
1128 object215 2015-05-22 02:43:27.692 HSC-R HETDEX	30.00 39.15 0.00 0.85 27.53 302.7	2 0.87 3.72 3.72 H-02-107-01-00000	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	е 🔲
1126 object214 2015-05-22 02:40:38.499 HSC-R HETDEX	120.00 <mark>38.39</mark> 0.00 0.76 <mark>27.52</mark> 1250	.21 0.86 3.72 3.74 H-02-108-01-00003	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	🕑 chart 🔲 series
1124 object213 2015-05-22 02:37:52.486 HSC-R HETDEX	120.00 38.84 0.00 0.68 27.47 1265	.72 0.83 3.72 3.70 H-02-108-01-00002	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \eth \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \eth \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	0.90 4.00
1122 object212 2015-05-22 02:35:13.333 HSC-R HETDEX	120.00 <mark>39.21</mark> 0.00 0.72 <mark>27.23</mark> 1302	.90 0.67 3.72 3.82 H-02-108-01-00001	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow 0.2cm$	best focus
1120 object211 2015-05-22 02:34:03.744 HSC-R HETDEX	30.00 39.40 0.00 0.65 27.14 332.1	3 0.60 3.72 3.70 H-02-108-01-00000	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	0.80 3.90 focus
1118 object210 2015-05-22 02:31:11.435 HSC-R HETDEX	120.00 <mark>40.37</mark> 0.00 0.60 <mark>27.19</mark> 1311	.96 0.64 3.72 3.80 H-02-073-01-00003	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \eth \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \eth \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	
1116 object209 2015-05-22 02:28:30.429 HSC-R HETDEX	120.00 <mark>40.82</mark> 0.00 0.65 <mark>27.33</mark> 1289	.42 <mark>0.72 3.72 3.73 </mark> H-02-073-01-00002	$\rho \ \Rightarrow \ \delta \ \Delta \ \# \ \delta \ \Delta \ \# \ \Rightarrow \ \Rightarrow \ \Rightarrow$	
1114 object208 2015-05-22 02:25:50.108 HSC-R HETDEX	120.00 41.20 0.00 0.61 27.45 1267	.81 0.80 3.72 <mark>3.76</mark> H-02-073-01-00001	$\rho \Rightarrow \delta \Delta \# \delta \Delta \# \Rightarrow \Rightarrow$	0.60 3.70
1112 object207 2015-05-22 02:24:39.348 HSC-R HETDEX	30.00 41.40 0.00 0.59 27.53 305.9	4 0.88 3.72 3.75 H-02-073-01-00000	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	
1110 object206 2015-05-22 02:21:49.147 HSC-R HETDEX	120.00 <mark>41.21</mark> 0.00 0.68 <mark>27.49</mark> 1229	.92 0.84 3.74 3.69 H-02-039-01-00003	$\rho \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \delta \hspace{0.2cm} \Delta \hspace{0.2cm} \# \hspace{0.2cm} \Rightarrow \hspace{0.2cm} \Rightarrow \hspace{0.2cm}$	0.50 3.60
1108 object205 2015-05-22 02:19:08.867 HSC-R HETDEX	120.00 41.66 0.00 0.62 27.50 1207	.27 0.84 3.74 3.67 H-02-039-01-00002	$\rho \Rightarrow \delta \Delta \# \delta \Delta \# \Rightarrow \Rightarrow$	0.40 3.50
1106 object204 2015-05-22 02:16:27.313 HSC-R HETDEX	120.00 <mark>42.04</mark> 0.00 0.58 <mark>27.56</mark> 1188	.47 0.89 3.74 3.69 H-02-039-01-00001	$\rho \Rightarrow \delta \Delta \# \delta \Delta \# \Rightarrow \Rightarrow$	22:00 23:00 00:00 01:00 02:00 observed at (UTC-10)
1104 object203 2015-05-22 02:15:15.589 HSC-R HETDEX	30.00 <mark>42.25</mark> 0.00 0.61 <mark>27.55</mark> 294.3	3 0.89 3.74 3.72 H-02-039-01-00000	$\rho \Rightarrow \delta \Delta \# \delta \Delta \# \Rightarrow \Rightarrow$	observed at (UIC-IU)
1102 object202 2015-05-22 02:12:25.298 HSC-R HETDEX	120.00 41.48 0.00 0.64 27.55 1199	.75 0.88 3.74 3.72 H-02-040-01-00003	$\rho \ \Rightarrow \ \delta \ \Delta \ \# \ \delta \ \Delta \ \# \ \Rightarrow \ \Rightarrow \ \Rightarrow$	e
1100 object201 2015-05-22 02:09:45.373 HSC-R HETDEX	120 00 41 93 0 00 0 58 27 56 1191	.51 0.89 3.74 3.66 H-02-040-01-00002	$\rho \Rightarrow \sigma \wedge \# \sigma \wedge \# \Rightarrow \Rightarrow \Rightarrow$	e

The analysis system is constructed by Furusawa-san et al.
The web interface is constructed by Koike-san.

## Initial QA: On-site analysis system seeing and transparency

HSC Monitor								Fumiaki
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a お気に入り 「 Hyper Suprime-Cam   HSC Mon	itor 🚮 Munin :: localhost :: 🗌 F	B hscsupro	Subaru Telescope	GMail 🔣 God	pale+ 🖸 YouTube	🥂 Google マップ 📒 C	utlook.com - aad2	# Bookmarks
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31160 object231 2015-05-22 03:22:05:337 H30-R HETDEX			H-02-071-01-00000 p	ο δ Δ # δ	4 # 3 3 3 3		e 🖂	
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	120.00 34.83 0.0 0.78 27.54	1299.40 0.87 3.72 3.8			4 4 3 3 3 3		e 😑	
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· ·		314.56 0.87 3.72 3.7		• 0 A # 0	Δ # -> -> ->		e 📄	
	120.00 38.12 0.00 0.70 27.50		Η-0. 07-01-00003 ρ -	• 0 A # 0	$\Delta = \rightarrow \rightarrow$		e 🛛	
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31130 object216 2015-05-22 02:44:38.237 HSC-R HETDEX	120.00 38.95 0.00 0.73 27.50	1240.66 0.84 3.72 3.7	H-02-107-01-000s	• 0 A # 0	$\Delta \# \rightarrow \rightarrow \rightarrow$		e	
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31126 object214 2015-05-22 02:40:38.499 HSC-R HETDEX	120.00 38.39 0.00 0.76 27.52	1250.21 0.86 3.72 3.7	H-02-108-01-00003 p	. 0 # 0	∆ # → → → Ø	hart 🔲 series	0	
31124 object213 2015-05-22 02:37:52.486 HSC-B HETDEX	120.00 38.84 0.00 0.68 27.47	1265.72 0.83 3.72 3.7	H-02-108-01-00002 p	• 6 A F	A # -> -> -> ->	0 - 4.00		
31122 object212 2015-05-22 02:35:13.333 HSC-R HETDEX	120.00 39.21 0.00 0.72 27.23	1302.90 0.67 3.72 3.8	H-02-108-01-00001 p -	• 0 A # 0		best focus	1 o	
	30.00 39.40 0.00 0.65 27.14	332.13 0.60 3.72 3.7	H-02-108-01-00000 p -	• 8 Δ # 8	Δ #	0 3.90 focus		
31118 object210 2015-05-22 02:31:11.435 HSC-R HETDEX	120.00 40.37 0.00 0.60 27.19	1311.96 0.64 3.72 3.8	Η-02-073-01-00003 ρ -	• δ Δ # δ	∆ # → →	seeing		
31116 object209 2015-05-22 02:28:30.429 HSC-R HETDEX	120.00 40.82 0.00 0.65 27.33	1289.42 0.72 3.72 3.7	H-02-073-01-00002 p -	• 8 Δ # 8	∆ # → → →	3.80		
31114 object208 2015-05-22 02:25:50.108 HSC-R HETDEX	120.00 41.20 0.00 0.61 27.45	1267.81 0.80 3.72 3.7	H-02-073-01-00001 p =	<ul> <li>δ Δ # δ</li> </ul>	$\Delta \# \rightarrow \rightarrow \rightarrow 0.0$	0 3.7	300 apar 6 2	
31112 object207 2015-05-22 02:24:39.348 HSC-R HETDEX	30.00 41.40 0.00 0.59 27.53	305.94 0.88 3.72 3.7	H-02-073-01-00000 ρ -	• \$ \$ \$ # \$	∆ # → → →		80 . 6 . 6 . 1	1 4. 14. 14
31110 object206 2015-05-22 02:21:49.147 HSC-R HETDEX	120.00 41.21 0.00 0.68 27.49	1229.92 0.84 3.74 3.6	H-02-039-01-00003 p =	<ul> <li>δ Δ # δ</li> </ul>		0 3.60		
31108 object205 2015-05-22 02:19:08.867 HSC-R HETDEX	120.00 41.66 0.00 0.62 27.50	1207.27 0.84 3.74 3.6	H-02-039-01-00002 p -	• \$ \$ \$ # \$		0 3.50		
31106 object204 2015-05-22 02:16:27.313 HSC-R HETDEX	120.00 42.04 0.00 0.58 27.56	1188.47 0.89 3.74 3.6	H-02-039-01-00001 p =	<ul> <li>δ Δ # δ</li> </ul>	Δ # => == ==	22:00 23:0		00 02:00
31104 object203 2015-05-22 02:15:15.589 HSC-R HETDEX	30.00 42.25 0.00 0.61 27.55	294.33 0.89 3.74 3.7	H-02-039-01-00000 ρ -	• \$ \$ \$ # \$	∆ # → → →	ob	served at (0.010)	
31102 object202 2015-05-22 02:12:25.298 HSC-R HETDEX	120.00 41.48 0.00 0.64 27.55	1199.75 0.88 3.74 3.7	H-02-040-01-00003 p	<ul> <li>δ Δ # δ</li> </ul>	Δ # · · · ·		e 😑	
31100 object201 2015-05-22 02:09:45.373 HSC-R HETDEX	120.00 41.93 0.00 0.58 27.56	1191.51 0.89 3.74 3.6	H-02-040-01-00002 p -	• 0 A # 0	$\Delta \# \rightarrow \rightarrow \rightarrow$		c 📄	

2015-05-2 to 2015-05-2 #500@1 /1 <										
<sup>:</sup> → png		csv	excel	json po	pdf					
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_	0.73	27.53	324.75	0.87	3.7					
0	.75	27.51	1305.15	0.86	3.7					
0	.78	27.54	1299.40	0.87	3.7					
0	.73	27.54	1295.55	0.87	3.7					
0	.76	27.55	324.08	0.88	3.7					
0	.73	27.54	1322.35	0.88	3.7					
0	.75	27.54	1315.75	0.88	3.7					
0	.75	27.55	1318.43	0.88	3.7					
0	.82	27.54	329.90	0.88	3.7					
-			1005 10		<u> </u>					

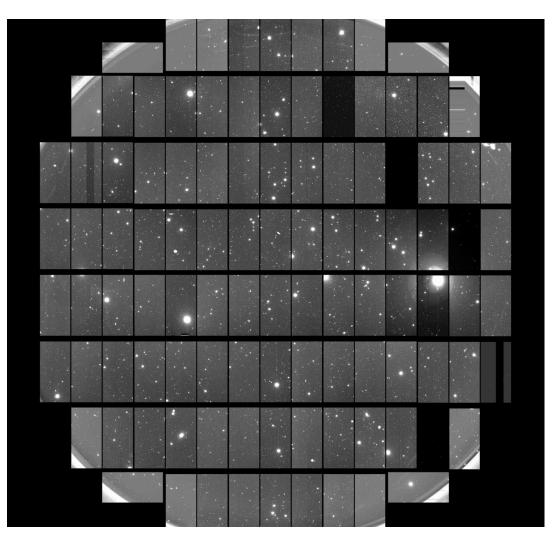
- For deriving Seeing and transparency, data of all CCD chips are considered.
- The transparency is estimated using SDSS catalog.

# Initial QA: On-site analysis system reduced image

Pumiak						
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push the buttons at this row to check the reduced images.

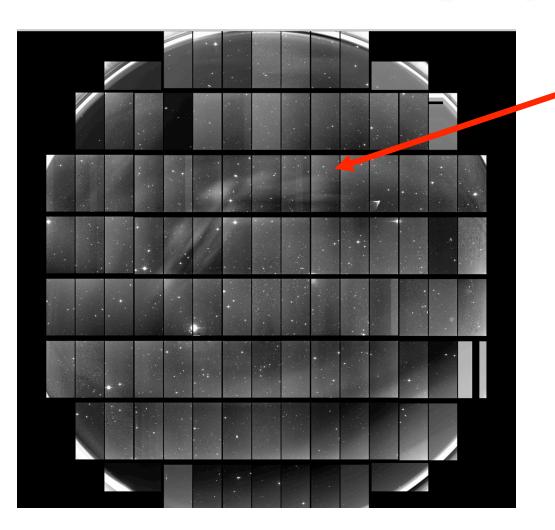
# Initial QA: On-site analysis system reduced image



Reduced image (flatfielded)

- Check satellite trails, and ghost/stray lights by bright stars.
- Check whether faint objects is not fallen to CCD gaps.

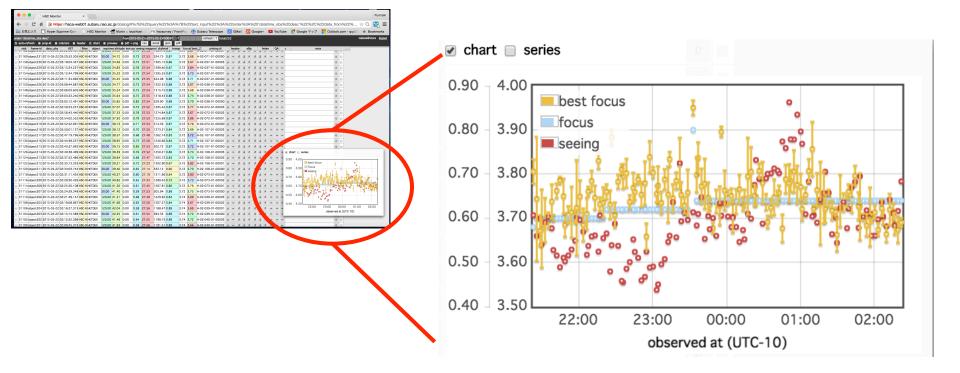
# Initial QA: On-site analysis system reduced image (stray light)



When we take images under bright moon condition,especially brighter than half moon, stray lights may be affected.

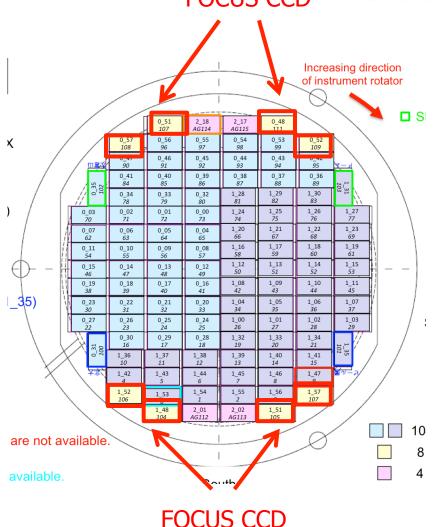
For avoiding the stray lights, we will not observe targets, which is close (<u>D<30deg</u>) to Moon.

## Initial QA: On-site analysis system best z



When the difference of 'best focus' and 'focus' becomes large continuously, we may need to adjust the telescope focus.

## Initial QA: On-site analysis system FOCUS CCD best z



- Best z is derived from 8 'FOCUS CCDs' at inside the dewar.
- The heights of these CCDs are different from those of 104 science CCDs.

## Initial QA: On-site analysis system Non-SDSS field

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er	object					_	ero skylev	_	p foc
		30.00		-90.00			0.00	-9999.00	3.80
	BIAS	0.00	54.76	-90.00	-1.00	-99.00	0.00	-9999.00	3.80
	BIAS	0.00	54.76	-90.00	-1.00	-99.00	0.00	-9999.00	3.80
	BIAS	0.00	54.76	-90.00	-1.00	-99.00	0.00	-9999.00	3.80
	BIAS	0.00	54.76	-90.00	-1.00	-99.00	0.00	-9999.00	3.80
	BIAS	0.00	54.76	-90.00	-1.00	-99.00	0.00	-9999.00	3.80
15	BD_33D2642	10.00	27.10	-90.00	1.38	-99.00	18.40	-9999.00	4.20
15	BD_33D2642	7.00	27.88	-90.00	1.38	-99.00	7.85	-9999.00	4.20
15	UMI_F4	0.33	22.86	90.00	0.59	-99.00	0.39	-9999.00	3.80
15	UMI_F4	240.00	23.27	90.00	0.68	-99.00	186.88	-9999.00	3.80
15	UMI_F4	240.00	23.75	90.00	0.62	-99.00	141.55	-9999.00	3.76
15	UMI_F4	240.00	24.25	90.00	0.59	-99.00	121.85	-9999.00	3.76
15	UMI_F3	240.00	23.56	90.00	0.59	-99.00	115.65	-9999.00	3.76
15	UMI_F3	240.00	23.97	90.00	0.61	-99.00	110.77	-9999.00	3.76

- For Non-SDSS field, The analysis system cannot derive transparency.
- Before (and after?) taking Non-SDSS fields, we will take SDSS fields for calibration.
- By the transparency derived by the calibration frames, we may be able to estimate that at the Non-SDSS fields.
  - Relative photometry?
  - CFHT SkyProbe?
- However, it is not perfect. Thus, we may not be able to guarantee the transparency completely for Non-SDSS fields.

#### Initial QA (IQA)

cf. Iwata-san's slide

- Especially using on-site analysis system, night observers report whether each data meets criteria PIs set.
- Considering that weather may change during observations
  - Seeing: 0.1 tolerance will be applied.
    - ♦ If the PI asks for seeing <0.8", observations done with seeing <0.9" will be considered as completed.</p>
  - Transparency: 20% tolerance will be applied.
    - ♦ If the PI asks for T>80%, observations done with T>64% will be considered as completed.

 $\bullet$  The night observers will decide the rough estimate of quality

- 'good': meet constraints
- `marginal': need more investigation

#### Final QA (FQA)

cf. Twata-san's slide

 $\bullet$  Final QA will be done next day of observation by another day time staff. (not night observers)

Checking a night log written by night observers.

Deciding whether each OB satisfies criteria PIs set.

Especially checking `marginal' data is important.

- $\bullet$  If the OB does not meet the criteria (seeing, transparencies), it will bring back to queue.

 $\bullet$  Even if only 1 of exposures will not pass the FQA, the OB will bring back to queue.

 $\bullet$  Longer OB has less probability to be executed.



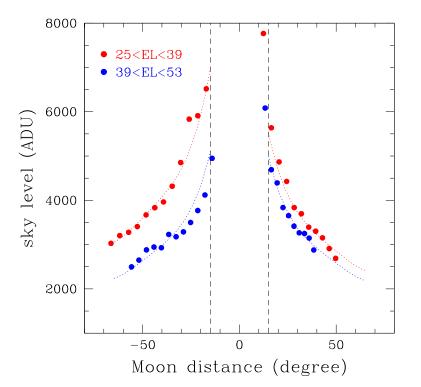
The total on-source time of OB must be < 100min.</p>

 If you plan to do the Ndith-mode observation with large N (e.g., N>5), it is better to divide the observation into a few OBs.

#### Exposure Time Calculator (ETC)

#### Parameter:

- Seeing
- Transparency
- ♦ Moon phase
- Moon distance
  - To avoid the affect of stray lights the moon distance should be larger than 30deg.



#### Moon distance vs. skybackground