Ohyama (chair) Let's start the discussion from the perspective of multi-wavelength analysis of HSC sources.

Imase
We can gain much from synergy of HSC with radio surveys, such as FIRST. Radio-loud AGNs that were not detected by SDSS can be explored with HSC. 60% of FIRST sources have no SDSS counterpart, which are interesting targets for HSC.

Strauss
The warm Spitzer mission is a very powerful tool for HSC science. It's important to have discussion about AGN sciences with the deep Spitzer data.

Nagao
The cadence of the Spitzer program is unique and attractive, but we observe dust component rather than the accretion disk in MIR band. Is variability selection of AGNs in MIR bands feasible?

Oyabu
It would be hard to make use of MIR variability to search for AGNs, because the variation is much diluted in those wave bands.

Minezaki
Rest-frame MIR variability of AGNs would be small and difficult to detect, except for some previously-reported cases of radio-loud AGNs.

Imanishi
When rest-frame NIR radiation is observed in MIR, a source is distant, has high luminosity and large dust torus. What is the typical timescale of variability in this case?

Minezaki
Not sure but an order of a year.

Imanishi
So the bottom line is that the detection of MIR time variation is difficult?

Minezaki
It must be certainly difficult, especially at high redshifts.

Ohyama (chair)
Lots of quasars are expected to be observed in the multi-wavelength surveys, eROSITA for example. What fraction of these sources are on HSC images, and what fraction of these interesting objects should be followed up?

Nagao
We gave no expected numbers of quasars in multi-wavelength data in the White Paper, but they should be important not only for HSC but also for PFS.

Strauss
We certainly need some selection of targets for spectroscopic follow-up, and that issue will be addressed in my talk about the PFS tomorrow.

Ohyama (chair)
There is two ways to go, e.g., focusing on conventional (optically-selected) quasars or on various sub-types of AGNs based on multi-wavelength studies. What is our overall direction?

Strauss
We can identify candidates with these various approaches, but it will be difficult to convince ourselves that imaging data are enough for our science cases. We will have to wait for PFS for some of them. Or we can follow-up subsamples of interesting objects and do statistical analysis.

Ohyama (chair)
How can we study the environmental effects of AGNs by utilizing multi-wavelength data? WISE data for example?

Oyabu
WISE survey is too shallow to study distant galaxies around AGNs.

Ohyama (chair)
Does anyone have comments on even other wavelength data or tools?

Strauss
CCAT will carry out a survey in sub-mm and it will be important for us. JVLA and ACT should also be kept in mind for synergy with HSC.

Nagao
Imase-san is exploring the synergy of HSC with ACT but cannot find ACT parameters. Are there a summary document somewhere on the web?

Strauss
It should exist but I don't know where it is at the moment.

Ohyama (chair)
Now let's move on to the technical aspect of the HSC survey.

Strauss
Forced photometry is certainly important. I'm not sure whether it can be applied to all the external catalogs, but it is worth discussing.

Akiyama
Regarding the forced photometry, is it possible to ask the JVO people to collect multi-wavelength data of the HSC survey fields and help us to do forced photometry on these external images?

Shirasaki
The idea is interesting and we can try to make such a service.

Ohyama (chair)
Can we improve photo-z with multi-wavelength data, for example those in MIR bands? How significant is the effect of variability for color selection?

Strauss
If we know the structure function of AGN variation, then in general, we can incorporate it into the probabilistic selection model and see its effects.

Nagao
Is it difficult to include MIR bands to the photo-z code?

Tanaka
It should be easy if filter transmissions and appropriate AGN templates with dust component are available.

Akiyama
Quasar dust emission varies from quasar from quasar. This may complicate the photo-z procedure.

Tanaka
We can make the code to assign large errors to the MIR bands in that case.

Ohyama (chair)
Any comments on our overall action items?

Wada
We should invite radio (especially ALMA) observers to this discussion. It is important to understand ISM of AGN host galaxies to investigate the feeding and feedback processes.