Simulating GLAO Observations of Distant Galaxies

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We now know the outline of the Cosmic Star Formation History, but there are a lot of unresolved questions; we (briefly) know what happened, but we don’t know \textit{How} it has happened.

\textbf{Observations:}

\textbf{Large sample}: we need unbiased sample of galaxies at various redshift for statistically complete discussions, high dynamical ranges of physical parameters (mass, age, SFR, environment).

\textbf{Resolved imaging and spectroscopy}: galaxies have complex internal structures. We need finer views of morphologies and Integral Field Spectroscopy.
Number Density of Distant Galaxies

1.3<z<1.7: 40 (K_{AB}=22), 100 (K_{AB}=23)

2.1<z<2.6: 20 (K_{AB}=22), 80 (K_{AB}=23)
Simulating Imaging Obs. of z~2 Star-forming Galaxies

0.20"

Diffraction | GLAO center | GLAO 5'.0(b) | Seeing (0''.41)

Encircled energy

SNR

Radius ["]
Simulating Imaging Obs. of $z \sim 2$ Star-forming Galaxies

For Sersic index $n$, DL is needed.
Simulating Integral-Field Spectroscopy

<table>
<thead>
<tr>
<th>sBzK(I)</th>
<th>Model</th>
<th>Diff. Limit</th>
<th>GLAO</th>
<th>Seeing</th>
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<tbody>
<tr>
<td>Rotation</td>
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<td>Vel. Dispersion</td>
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<td>34852 (K=21.86AB)</td>
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0.20” 0.41”
AO is a strong candidate of Next-Gen AO for Subaru simulations of GLAO and observations of distant galaxies using GLAO

- 0.2 - 0.5 mag. sensitivity enhancement
- Better size determinations
- Better measurement of internal kinematics

AO + Wide-Field Multi-Object IFS

Legacy ‘3D’ Survey of Many Distant Galaxies