SFH and scale-length evolution of massive disk galaxies towards high-z

Massive disk galaxy formation in the early universe is crucial towards the understanding of galaxy formation theories. However, recent results by Barden et al. (2005, ApJ 635,959) reported
a weak size-stellar mass evolution of disks out to $z\sim 1$, as well as a decrease of the size of massive disk-dominated galaxies at $z\sim 2$ by a factor of $\sim
2$ compared with the local counterparts (Trujillo et al. 2006, ApJ 650, 18). Revising previous models,
Somerville et al. (2008, ApJ 672,776) could fit the new results up to $z\sim 1$, and predict that the scale length of
disks at $z\sim 3$ of a fixed stellar mass would be about 50%
as large as they are today. Considering the increasing evidences of high redshift
large disks recently (Labbe et al. 2003, ApJ 591, L95; Stockton et al. 2008, ApJ 672, 146; McGrath et al. 2008, ApJ 682, 303; Akiyama et al. 2008, ApJS 175, 1), a comprehensive spectroscopic studies of high-z disks on the size, dynamical
and stellar properties is particularly important for the understanding of the SFH of large disk galaxies, as well as their connection with AGN activities.