

X16a ALMA twenty-Six Arcmin² survey of GOODS-S At One-millimeter (ASAGAO):
The survey design and project overview

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We have conducted an unbiased deep imaging and spectroscopic survey using ALMA over ~ 26 arcmin² region in GOODS-S to unveil dust-obscured star-formation and nuclear activities in galaxies by exploiting richest multi-wavelength datasets with *Chandra*, *HST*, *Spitzer*, *Herschel*, *VLT* (Hawk-I and MUSE), *JVLA*, and so on. The resultant noise level of the 1.2-mm continuum image is $\sim 60 \mu\text{Jy}$ (1σ) after applying 250 k λ taper to have a modest beam size ($\sim 0.5''$). We put 2 frequency tunings to cover 244-248, 253-257, 259-263, and 268-272 GHz ranges (~ 16 GHz in total). The ASAGAO complements the ultra-deep HUDF surveys (~ 4 arcmin², Dunlop et al. and ASPECS-pilot/large) and a shallower survey (~ 70 arcmin², Elbaz et al.).