Stellar mass and star formation rate relation of infrared-bright dust-obscured galaxies selected with IRAS and AKARI far-infrared all-sky survey

Yoshiki Toba[1]; Tohru Nagao[2]; Wei-Hao Wang[1]; Hideo Matsuhara[3]; Masayuki Akiyama[4]; Tomotsugu Goto[5]; Yusei Koyama[6]; Youich Ohyama[1]; Issei Yamamura[3]

[1]*ASIAA;* [2]*Ehime Univ.;* [3]*ISAS/JAXA;* [4]*Tohoku Univ.;* [5]*NTHU;* [6]*Subaru Telescope*

We investigate the star forming activity of a sample of infrared (IR)-bright dust-obscured galaxies (DOGs) that show an extreme red color in the optical and IR regime, (i - [22])_AB > 7.0. Combining an IR-bright DOG sample with the flux at 22 micron > 3.8 mJy discovered by Toba & Nagao (2016) with IRAS faint source catalog version 2 and AKARI far-IR (FIR) all-sky survey bright source catalog version 2, we selected 109 DOGs with FIR data. For a subsample of 8 IR-bright DOGs with spectroscopic redshift (0.07 < z < 1.0) that was obtained from literature, we estimated their IR luminosity, star formation rate (SFR), and stellar mass based on the spectral energy distribution fitting. We found that (i) WISE 22 micron luminosity at observed frame is a good indicator of IR luminosity for IR-bright DOGs and (ii) the contribution of active galactic nucleus (AGN) to IR luminosity increases with IR luminosity. By comparing the stellar mass and SFR relation for our DOG sample and literature, we found that most of IR-bright DOGs lie significantly above the main sequence of star-forming galaxies at similar redshift, indicating that the majority of IRAS- and/or AKARI-detected IR-bright DOGs are starburst galaxies (Toba et al. 2017b, ApJ, submitted).