S23a Ionized gas outflows in infrared-bright dust-obscured galaxies selected with WISE and SDSS

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We present the ionized gas properties of infrared (IR)-bright dust-obscured galaxies (DOGs) that show an extreme optical/IR color, $(i-[22])_{\rm AB} > 7.0$, selected with the Sloan Digital Sky Survey (SDSS) and Wide-field Infrared Survey Explorer (WISE). For 36 IR-bright DOGs that show [O III]λ5007 emission in the SDSS spectra, we performed a detailed spectral analysis to investigate their ionized gas properties. In particular, we measured the velocity offset (the velocity with respect to the systemic velocity measured from the stellar absorption lines) and the velocity dispersion of the [O III] line. We found that the derived velocity offset ($v_{\rm [OIII]}$) and dispersion ($\sigma_{\rm [OIII]}$) of most IR-bright DOGs are larger than those of Seyfert 2 galaxies (Sy2s) at $z < 0.3$, meaning that the IR-bright DOGs show relatively strong outflows compared to Sy2s. This can be explained by the difference of IR luminosity contributed from AGN ($L_{\rm IR}^{\rm AGN}$) because we found that (i) $L_{\rm IR}^{\rm AGN}$ correlates with $v_{\rm [OIII]}$ and $\sigma_{\rm [OIII]}$, and (ii) our IR-bright DOG sample has larger $L_{\rm IR}^{\rm AGN}$ than Sy2s. Nevertheless, the fact that 28/36 ($\sim$ 78 %) IR-bright DOGs have a large (> 300 km s^{-1}) velocity dispersion, which is a larger fraction compared to other AGN populations, suggests that IR-bright DOGs are good laboratories to investigate AGN feedback (Toba et al. 2017, ApJ, to be submitted).