Comparison of the extraplanar Hα and UV emissions in the halos of nearby edge-on spiral galaxies

1. Motivation

"What is the proportion of the origin of the extraplanar Hα emission?"

- Traditional belief: extraplanar diffuse ionized gas (eDIG)
- Additional possible source: Hα photons scattered by extraplanar dust (eDust)

Problems with eDIG origin: The photoionization model is difficult to fully account for total extraplanar Hα emission.

In this study, we'd like to show “the multiphase nature of the extraplanar ISM and the possibility of Hα to be scattered by eDust”.

2. Target

38 nearby edge-on spiral galaxies observed from Hα galaxy surveys (LVL, SINGS, SINGG, HaGS, Hα3, Rossa&Detmar)

3. Result

(1) $Z_{H\alpha}$ is strongly correlated with $Z_{FUV}$:
- Multiphase nature of the ISM in galactic halo
- A substantial portion of extraplanar Hα caused by dust scattering

(2) $Z_{H\alpha}$ and $Z_{FUV}$ are correlated with SFR$_{FIR}$, $D_{25}$, and $\Sigma_{SFR,FIR}$:
- More tightly correlation to the SFR (stellar radiation and/or supernovae feedback)

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