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Keiichi Wada (Kagoshima University)

■ Title

Revealing the AGNs from low-z to high-z: the interplay of ALMA and radiative transfer simulations based on 3D hydrodynamic modeling

■ Summary

In order to understand structures of the Active Galactic Nuclei (AGNs) and their cosmological evolution, constructing plausible theoretical models of the interstellar medium (ISM) around supermassive black holes (SMBHs) is crucial. In this research, we will study the ISM in the central sub-pc to 100 pc by combining the high-resolution molecular/atomic line observations by ALMA and state-of-the-art line transfer calculations based on 3-D radiation-hydrodynamic simulations (Wada et al. 2016). This methodology in fact met great success for one of the nearby, low luminosity AGNs (Izumi et al. 2018). Here we will extend this to local and high-z AGNs with wide ranges of BH masses and luminosities, and try to compare them with future ALMA observations. The researcher hired by this project will contribute to the line transfer calculations (e.g. CO, HCO⁺, HCN, [CI]) using our 3D code, and synthetic observations using CASA. This comparison will strengthen our ALMA proposals in this project. He/she, who can be either an observer or theorist, will be expected to be an expert of this combined studies using simulations and ALMA.