



Contribution ID: 14

Type: **not specified**

Dynamical modeling of molecular Gas; hydrodynamics simulation of Gas disk around BH

Monday 30 May 2022 15:35 (15 minutes)

We present hydrodynamic simulations of the chemical evolution of the interstellar medium (ISM) gas influenced by the feedback from active galactic nuclei (AGN), coupled with the CHIMES code to treat the radiative cooling, AGN heating, and chemistry. We focus on the central 500 pc around the black hole (BH) where the AGN outflows and radiation couple to the ISM. In the simulation, we are modeling gas discs across a broad range of metallicities, gas fractions, and initial BH masses to evaluate the profile of the CO and H₂ molecular species. By making an Adaptive Mesh Refinement grid model and radiative transfer for a given geometrical distribution of gas and/or dust, we attempt to discern between the conflicting explanations for the apparently counterrotating gas in the AGN-dominated galaxy NGC 1068.

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Session Classification: Parallel Session: Galaxies & Cosmology