



Contribution ID : 90

Type : **Poster**

SMA observations of the archetypal CSS radio source 3C 303.1

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AGN (active galactic nuclei) feedback plays a crucial role in shaping galaxy evolution. Numerical simulations show that the kinetic energy transfer efficiency from radio jets to interstellar medium (ISM) is relatively high, suggesting a significant role of radio jets in the feedback. We investigate AGN feedback on cold gas in the compact steep-spectrum (CSS) radio source 3C 303.1. CSS sources are largely young radio galaxies evolving through dense environments of their host galaxies. This early evolutionary phase likely represents a critical stage in which the radio source has maximum impact on host galaxy evolution. 3C 303.1 is the only CSS source so far showing alignment in optical, X-ray and UV with the radio structure, making it an interesting source to investigate jet-feedback. We present continuum and spectral line observations of the J=3-2 transition of carbon monoxide (^{12}CO) of 3C 303.1, obtained with the Submillimeter Array. We detect continuum emission at 221.1 and 271.2-GHz. We do not detect the $^{12}\text{CO}(J=3-2)$ line and derive an upper limit on the molecular gas mass of $\sim 2.3 \times 10^9 M_{\odot}$. The gas-to-dust mass (G/D) ratio is found to be at the lower end of typical Galactic values, and the star-formation rate (SFR) derived is moderate but declining likely due to a recent quenching event. Therefore, $^{12}\text{CO}(J=3-2)$ non-detection, relatively low G/D ratio, and the moderate but declining SFR point to the shock-heating and/or removal of CO gas by AGN, consistent with the AGN feedback signatures observed in 3C 303.1.

Did you give a contributed talk at CASCA 2026?

No

If you are selected for a poster, would you be interested in giving a short flash talk on your work?

Yes

What is your career level?

PhD

Which keyword describes the area of focus of this talk?

Galaxies

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Session Classification : Galaxies