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Kinetic mode feedback: Radio galaxies and UFOs

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Fast outflows powered by AGN and interacting with the host galaxies' ISM are thought to be an important part of a feedback cycle that controls the global galactic star formation rate and the growth of the central supermassive black hole. Relativistic radio jets are sufficiently powerful to affect the gas-dynamics of the entire galaxy and counteract excessive cooling in galaxy clusters. The jets drive outflows of galactic gas in different phases at speeds of 200 to 1000 km s⁻¹. More recently, a class of AGN disc wind called Ultra Fast Outflow (UFO) were also deemed to be a candidate of powerful AGN feedback. We have shown with simulations of AGN jets and UFOs interacting with a two-phase interstellar medium, that the energy and momentum transfer by the jet or wind to dense clouds is indeed efficient, and that the subsequent dispersal of clouds leads to a decrease of the global star-formation rate. If cloud complexes are large or if most of the dense gas is located in a disc, however, the pressurization by the AGN blown bubble can, at least temporarily, lead to an increase in the global star-formation rate, and possibly also enhance accretion from sub-kpc scales.