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The star-gas misalignment from Horizon-AGN

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We have explored star-gas misalignment using Horizon-AGN simulation and compared the result with Sydney-AAO Multi-object Integral field spectrograph (SAMI) Galaxy Survey. While stars and gas are expected to have aligned rotational axes in a galaxy, IFU observations found that about 11% of the observed galaxies are misaligned. Horizon-AGN showed the distribution of misalignment angles found by the observation surprisingly closely. Moreover, Horizon-AGN reproduced the observed/expected misalignment features in terms of morphology, gas fraction, and galaxy mass. However, the simulation failed to reproduce the misalignment properties of galaxies in cluster environments. We also have investigated formation channels (origins) and a lifetime of star-gas misalignment using the simulation, which provides clues about how gas flows into galaxies and how gas accretion affects the galaxy evolution.

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