

R04b Gaseous Disc in a Triaxial Dark Matter Halo

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The origin of spiral arms is a long-standing problem in galaxy morphology, and is important for understanding the dense gas evolution. The gravitational potential of triaxial dark matter halos (DMH) is one factor thought to drive spiral arms but this is infrequently investigated. Due to the limited studies, whether triaxial DMHs could absolutely lead to arms forming in a gas disc or not remains questionable. We have conducted smoothed particle hydrodynamical simulations of a gaseous disc embedded in various different triaxial dark matter halos. We find that trailing spiral arms are easily produced. However, leading arms can also be induced in the inner disc but give way to trailing arms in the outer disc. In hot discs (above 10000K), leading spiral arms in the center survive and last well over 5Gyr. The activation function for the halo triaxality is very important in producing arms, especially in the time to fully activate and its shape. We then compare these halo-driven spiral arms to those formed by other mechanisms, such as in galactic fly-by encounters.