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Star formation in the extended gaseous disk of the isolated galaxy CIG 96

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We study the Kennicutt-Schmidt star formation law and efficiency in the gaseous disk of the isolated galaxy CIG 96 (NGC 864), with special emphasis on its unusually large atomic gas (HI) disk (r_HI/r_25 = 3.5, r_25 = 1.'85). We present deep GALEX near and far ultraviolet observations, used as a recent star formation tracer, and we compare them with new, high resolution (16", or 1.6 kpc) VLA HI observations. The UV and HI maps show good spatial correlation outside the inner 1', where the HI phase dominates over H_2. Star-forming regions in the extended gaseous disk are mainly located along the enhanced HI emission within two (relatively) symmetric giant gaseous spiral arm-like features, which emulate a HI pseudo-ring at a r \simeq 3' . Inside such structure, two smaller gaseous spiral arms extend from the NE and SW of the optical disk and connect to the previously mentioned HI pseudo-ring. Interestingly, we find that the (atomic) Kennicutt-Schmidt power law index systematically decreases with radius, from N \simeq 3.0 +- 0.3 in the inner disk (0.'8 - 1.'7) to N = 1.6 +- 0.5 in the outskirts of the gaseous disk (3.'3 - 4.'2). Although the star formation efficiency (SFE), the star formation rate per unit of gas, decreases with radius where the HI component dominates as is common in galaxies, we find that there is a break of the correlation at r = 1.5 r_25. At radii 1.5 r_25 < r < 3.5 r_25, mostly within the HI pseudo-ring structure, there exist regions whose SFE remains nearly constant, SFE \simeq 10^-11 yr^-1. We discuss about possible mechanisms that might be triggering the star formation in the outskirts of this galaxy, and we suggest that the constant SFE for such large radii r > 2 r_25 and at such low surface densities might be a common characteristic in extended UV disk galaxies.

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