

arXiv.org > astro-ph > arXiv:1107.5957

Astrophysics > Cosmology and Extragalactic Astrophysics

The Stability of Low Surface Brightness Disks Based on Multi-Wavelength Modeling

John M. MacLachlan, Lynn D. Matthews, Kenneth Wood, John S. Gallagher III

(Submitted on 29 Jul 2011)

To investigate the structure and composition of the dusty interstellar medium (ISM) of low surface brightness (LSB) disk galaxies, we have used multiwavelength photometry to construct spectral energy distributions for three low-mass, edge-on LSB galaxies. We use Monte Carlo radiation transfer codes that include the effects of transiently heated small grains and polycyclic aromatic hydrocarbon molecules to model and interpret the data. We find that unlike the high surface brightness galaxies previously modeled, the dust disks appear to have scale heights equal to or exceeding their stellar scale heights. This result supports the findings of previous studies that low mass disk galaxies have dust scale heights comparable to their stellar scale heights and suggests that the cold ISM of low mass, LSB disk galaxies may be stable against fragmentation and gravitational collapse. This may help to explain the lack of observed dust lanes in edge-on LSB galaxies and their low current star formation rates.

Comments:14 pages, 12 figures, accepted for publication in ApJSubjects:Cosmology and Extragalactic Astrophysics (astro-ph.CO)Cite as:arXiv:1107.5957 [astro-ph.CO](or arXiv:1107.5957v1 [astro-ph.CO] for this version)

Submission history

From: John MacLachlan M [view email] [v1] Fri, 29 Jul 2011 13:01:17 GMT (796kb,D)

Which authors of this paper are endorsers?

Link back to: arXiv, form interface, contact.

We gratefully acknowledge supp the Simons Fo and member ins

(<u>Help</u> | <u>Advance</u> All papers ↓

Download:

• PDF

Search or Article-id

Other formats

Current browse cont astro-ph.CO < prev | next >

new | recent | 1107

Change to browse b

astro-ph

References & Citatio

- INSPIRE HEP
- (refers to | cited by)NASA ADS

Bookmark(what is this?)