Planck Cold Clumps at High Galactic Latitude

– weekly report

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Work colletion by week

1. 3.4-3.10

2. 3.18-3.24

Introduction

3.4-3.10

- 主要修改了 introduction
- 增加了对 N_2H^+(1-0) 和 C_2H(1-0) 两条线的总述
- 对作出的图进行分析

修改 introduction 部分

第一段

In the past several decades, surveys of the molecular content of the Galaxy have been undertaken by many groups...have lower density than those towards the Galactic plane, which are often called translucent clouds ...This advantage attracts a group of astronomers turing to the molecular clouds at high latitude other than those at galactic plane. ~~The distribution of star formation over the Galactic plane remains unknown: how high latitude can star formation still exist or in what kind of process and phase of the HLCs are?~~

修改 introduction 部分

第二段

Magnani and Blitz believed the molecular clouds are optical dark and observed the CO line toward optical obsurations...detailed information within 1pc demonstrated that the distribution of molecular clouds show smaller structures...Yamamoto followed up wtih observation toward the HI filament region including MBM 53, 54, and 55 with approximately 141 square degree.

修改 introduction 部分

第三段

However, the research of HLCs demands far more investigation and information(表示前人工作仍有需要补充的地方)...One doable method is to use the relatively accurate spacing telescope to detect the specified regions of HGal. And this is what we did as follows. (引入我们的方法)

修改 introduction 部分

第四段

Planck surveys provide an unprecedented complete space distribution of sources...The $30''$ grid spacing satisfys the accuracy to detect the detailed structure of clumpy clouds within 1pc...
10 K to 15 K probably the coldest parts of ISM, which enables us to probe the characteristics of the prestellar phase or starless clumps... But...PGCCs provide continuum spectrum...Fortunately, PMO observation provides all three CO lines.

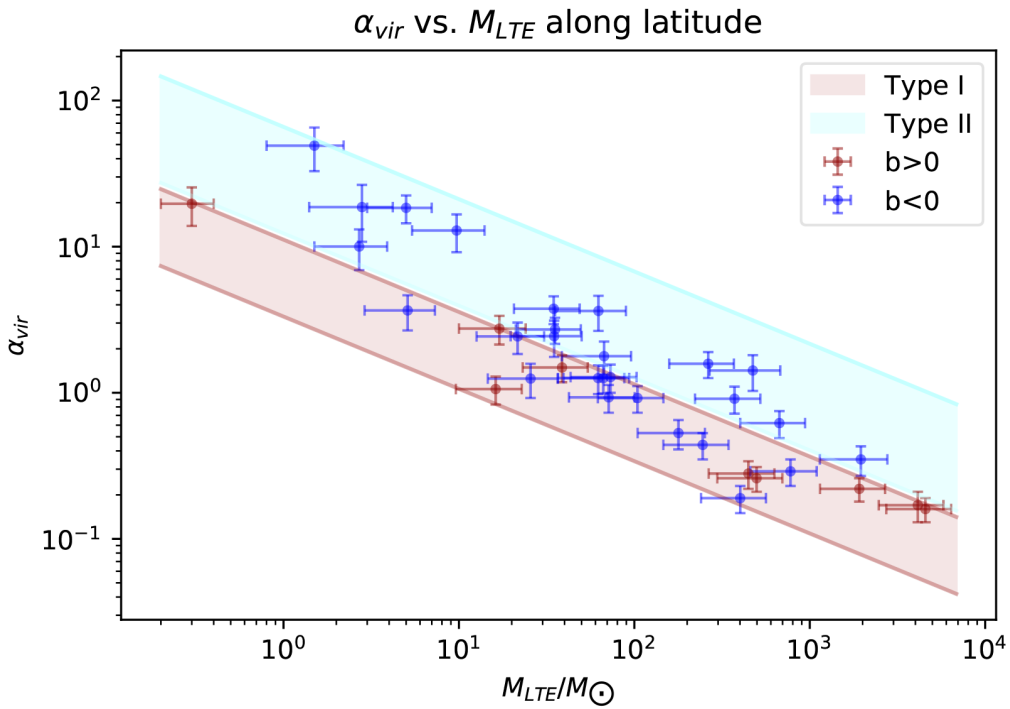
增加两条谱线的总述

N_2H^+, C_2H

Besides, we also observe another two emission lines N_2H^+ (1-0) and C_2H (1-0) for high galactic latitude as supplementary observation. Both two lines are dense region tracers, and even evolutional period detector if at all.

对作出的图进行分析

3.4-3.11



直接拟合出两个带状的分布 猜测银经大于 0 的都是 TypeI，作拟合并且分为明显的两类，进一步发现银经大于 0 的 clumps 都是孤立的，而银纬小于 0 的存在大尺度的 Filament 结构，猜测是 Filament 促生了 TypeII 的产生

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修改 Introduction
第一段

寻找 prestellar cores 有利于了解 initial condition

Exploring the initial condition facilitates the study of star formation. Astronomers are encouraged to search for most primitive molecular cores because these cores are close to initial evolution stage of forming stars, which are also called prestellar cores.

寻找到演化阶段越来越早的 star formation

The prestellar cores and properties were widely involved since very early time and follow-up work concentrates on finding more primordinal molecular cores.

修改 Introdcution
第二段

高银纬的源能够提供极早期的分子云团

Molecular clouds at high Galactic latitude just provide us with a set of translucent clouds as a most early stage supplement of star formation...the HCLs appear to be extraordianry young and may represent the earliest stages of molecular clouds condensing from the interstellar medium. There is no question that the molecular clouds in this region will lead us to an extremely initial condition of star formation.

修改 Introdcution

第三段

银河系整体的分布情况，latitude 是一个敏感参数

Apart from pursuing more primitive condition of molecular cores, another mission to study star formation of equal importance is to investigate the property and condition of the whole galaxy. Previous work have shown that the methal masers which trace the massive star-forming region are rare at high latitude($|b| > 2^\circ$) , which inspires that the latitude is a sensitive parameter for galactic star formation.

修改 Introdcution

第三段

早期工作局限在银盘附近

However, in the past several decades, surveys of the molecular content of the Galaxy undertaken by many groups(...) have been of material either closely confined to the Galactic plane or limited to low galactic latitude (not higher than 30°, Dame), which reveals very little information about the molecular gas at HGal.

修改 Introduction
第三段

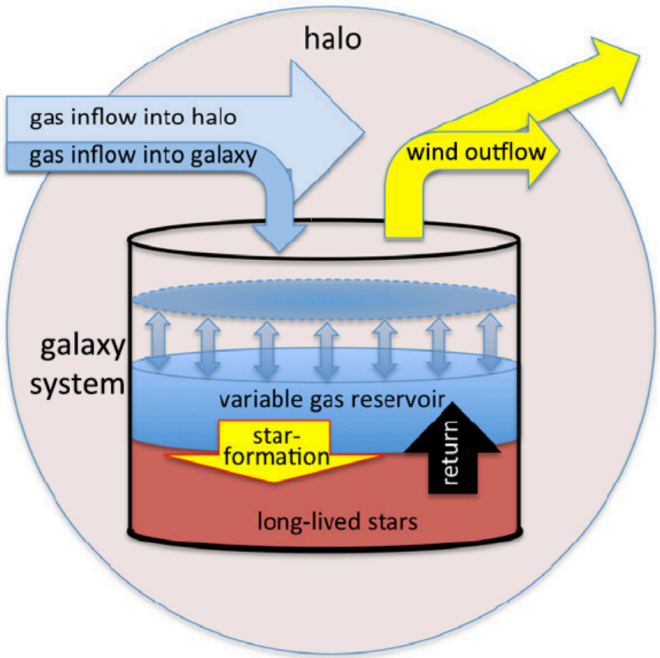


图: Lilly et al. 2013

But the star formation still exists at HGal althought relatively rare. Besides, the gas at HGal as a variable gas reservoir probably plays an important role in the cycle of the galactic gas. The property of the gas can be quite different from that in the galactic plane due to different roles in the cycle procedure.

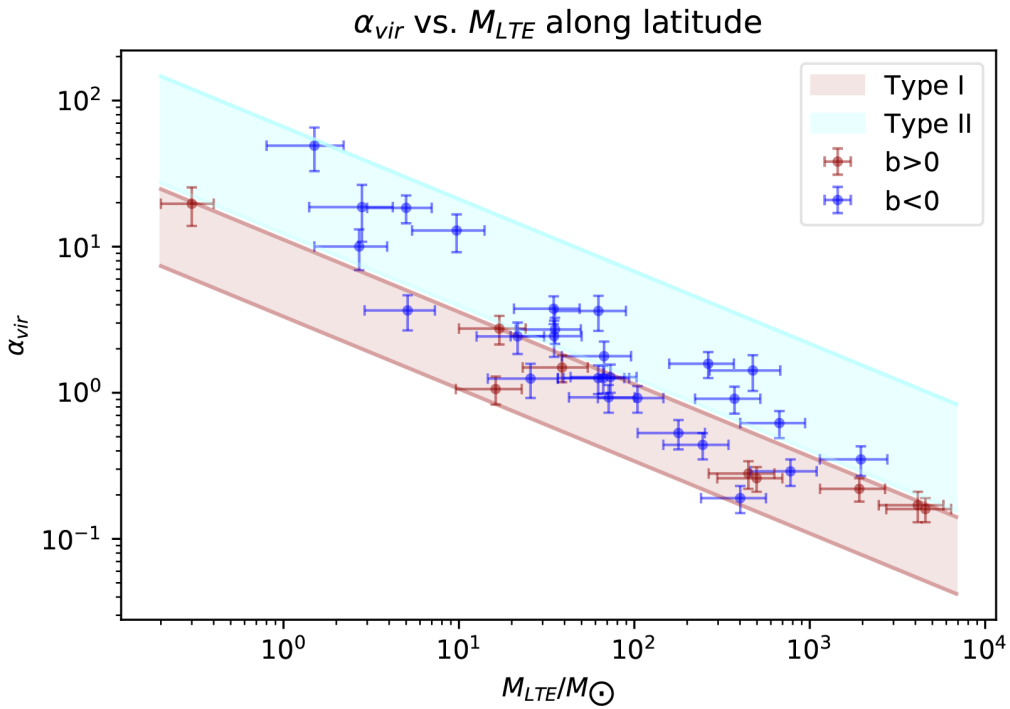
修改 Introduction

Conclusion

1. 从 initial condition 引出寻找更早期恒星形成演化阶段的必要
2. 高银纬就能够提供这种样本
3. 对于银河系整体恒星形成分布情况，银纬是一个敏感参量，没有理由仅仅了解银盘附近的情况而忽略银纬度高的地方
4. 早期的工作局限在银纬低的地方
5. 高银纬的地方真的存在恒星形成活动，并且气体性质很不同，值得研究

对作出的图进行分析

3.4-3.11 遗留



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