M51- Observation

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Group – C Nearby Galaxy
11/09/2k9
Outline

✧ Observation
  ● Source
  ● Receiver & Backend
  ● Pointing & focus
✧ Observing Strategy
  ● OTF
  ● Raster Scan
✧ Results
Observation

M51
SA(s)bc
11’.2 X 6’.9

CO(1-0) & CO(2-1) molecular lines

Receiver & Backend (115 & 230 GHz)
  Frontend : EMIR
  Backend : Wilma & 4 MHz
Data Reduction package – GILDAS Package (Class, Greg)
 Calibration

Sky contribution
Hot and cold load measurements

\[ P_{\text{wv}} = 15 \text{ mm} \]
\[ \text{Freq} = 115.27 \text{GHz} \]
\[ \text{El} \sim 53.7 \text{ deg} \]
Pointing & Focus

- Cross scan on Saturn to check the pointing of the antenna
- Focus

Source: Saturn  
Scan: 203  
Telescope: IRAM 30m  
Date: 2009-09-06

Frontend: E090HUO  
Backend: CONT/1

Azimuth = 213.5°  
Elevation = 52.7°

Current focus: sfcz = -2 mm
Focus offset: Δ = +0.98 mm
New focus: sfcz = -1.02 mm
Observing strategy

On The Fly mapping
OTFmap: 2’ X 2’ (from the center)
Observing mode (switch mode): total power
Tphase 0.5
Spatial sampling 8”, HPBW = 20”
OTF map CO(1-0)

- Baseline (considering only the line window, 350-650 Km/sec)
- Peak Intensity = 60 K Km/sec (integrated@ the core)
CO(2-1) detection

$T_{sb} \sim 116.00 \, K$ (I @ core)
Raster Scan map

EMIR-Wilma
SW - Wobbler with 2’ offset for OFF
15.6s per pointing
Peak intensity in (0,0) ⇒ 55.5 K km/s
(Beam Efficiency 0.8)
CO(2-1) detection, Hera

$T_{sb} = 36.6$
Comparing with other types of emission

CO/HI
Comparing with other types of emission

CO/Hα
Comparing with other types of emission

CO/8.0µm
Comparing with other types of emission

CO/24µm