

Informativity on A_V (mutual information)

Lucas Einig

IRAM - GIPSA-lab

February 20, 2024

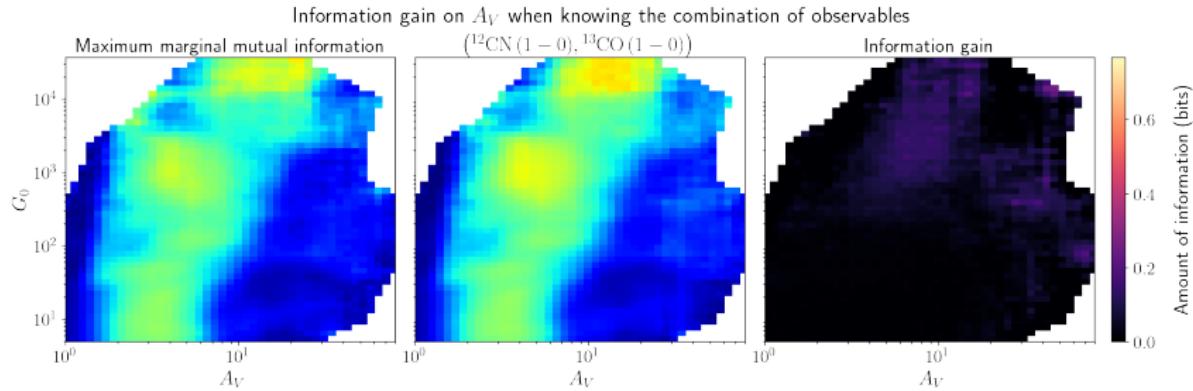
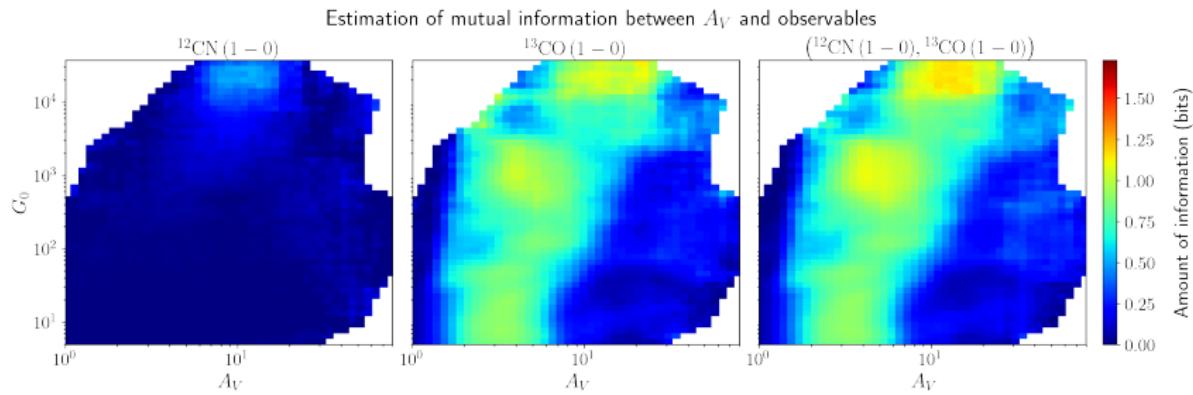
Outline

- 1 Combinations including ^{13}CO (1 – 0) (11 available)
- 2 Combinations including ^{12}CO (1 – 0) (11 available)
- 3 Combinations including C^{18}O (1 – 0) (11 available)
- 4 Combinations including ^{32}SO (2 – 1) (11 available)
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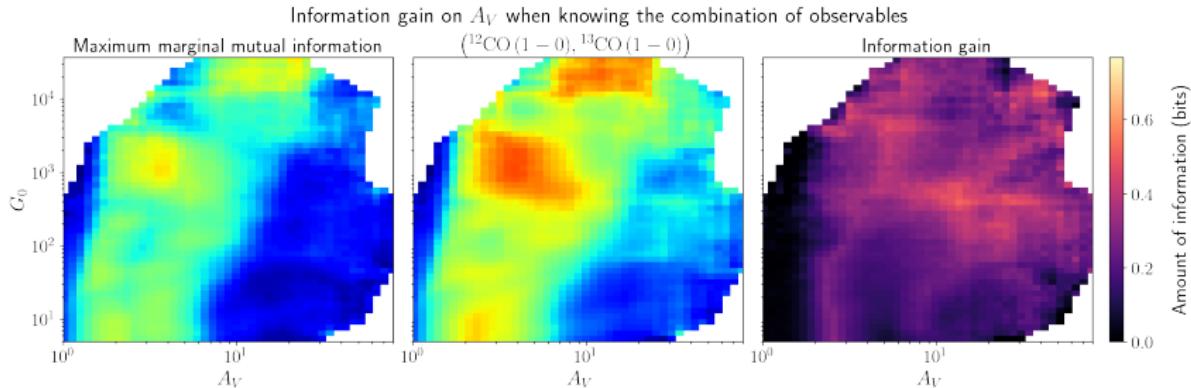
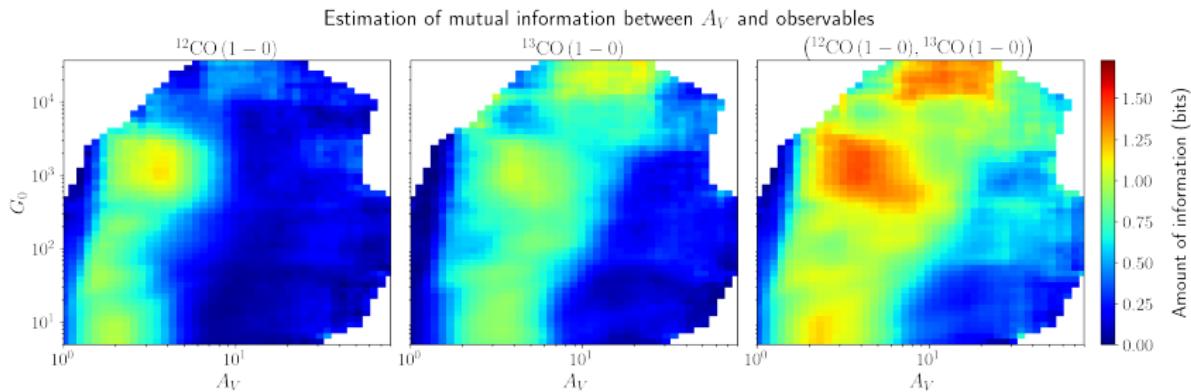
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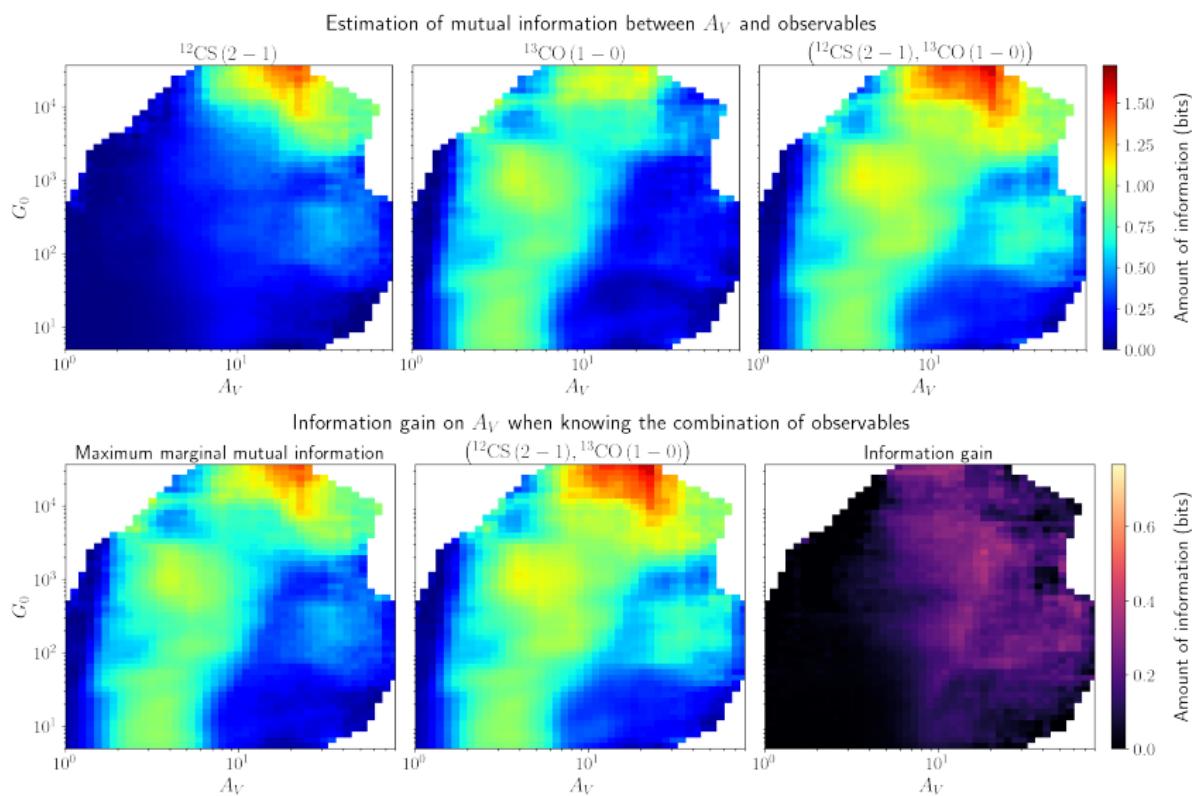
Informativity on A_V of $(^{12}\text{CN} (1 - 0), ^{13}\text{CO} (1 - 0))$



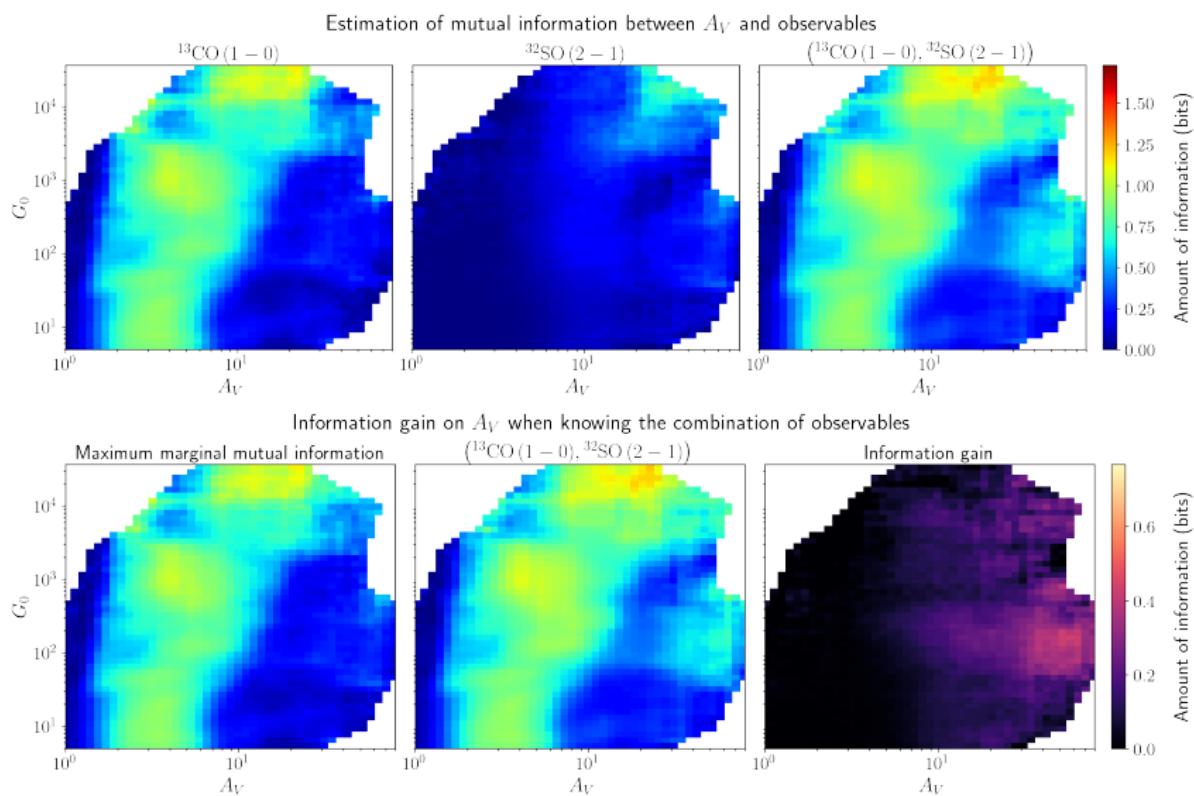
Informativity on A_V of $(^{12}\text{CO} (1 - 0), ^{13}\text{CO} (1 - 0))$



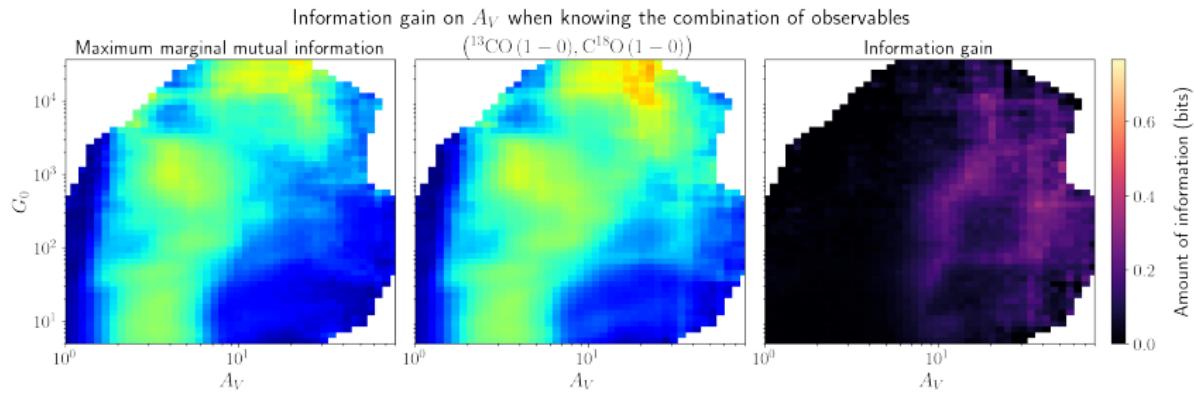
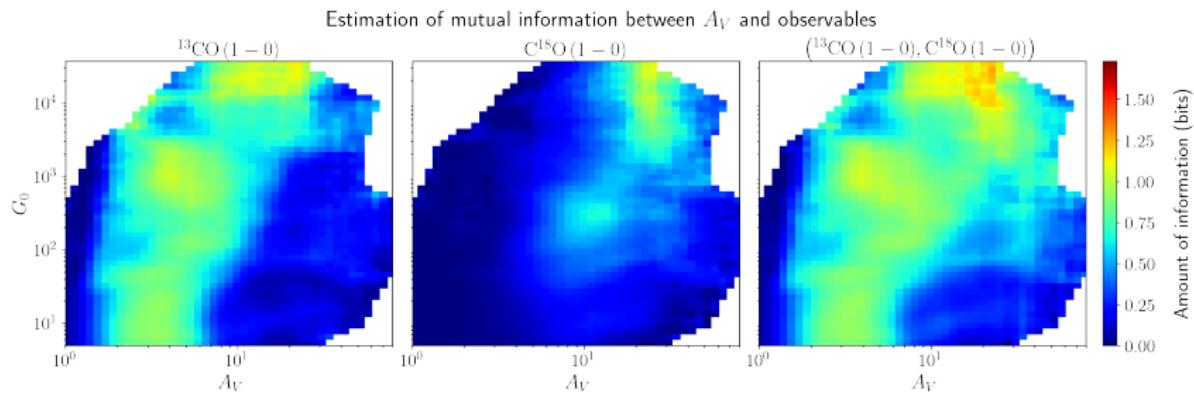
Informativity on A_V of $(^{12}\text{CS} (2 - 1), ^{13}\text{CO} (1 - 0))$



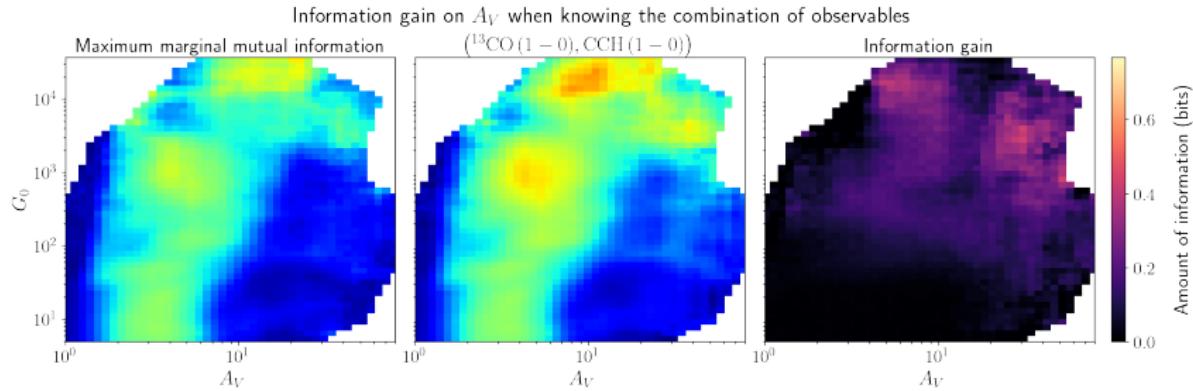
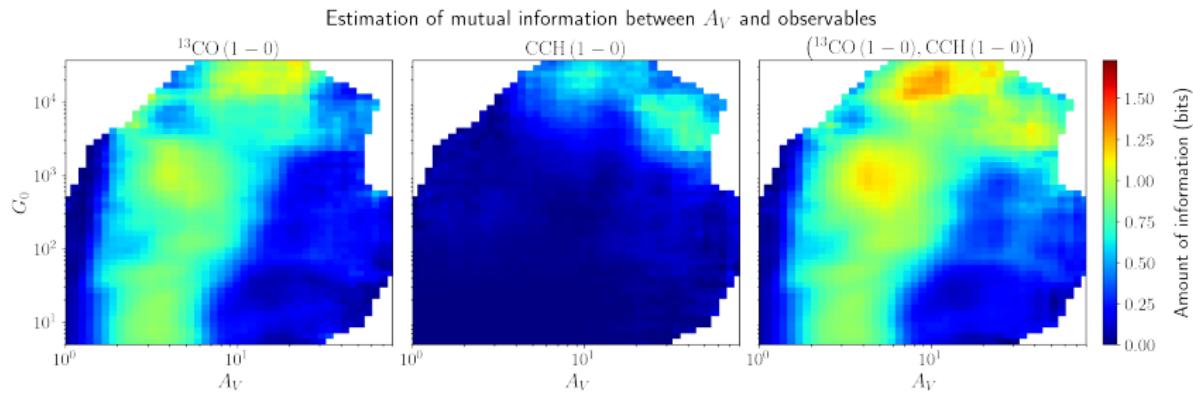
Informativity on A_V of $(^{13}\text{CO} (1 - 0), ^{32}\text{SO} (2 - 1))$



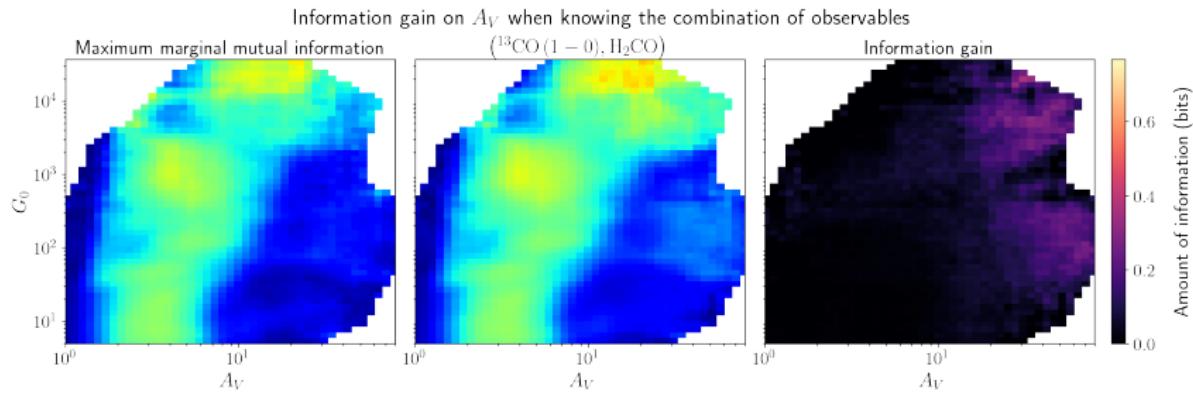
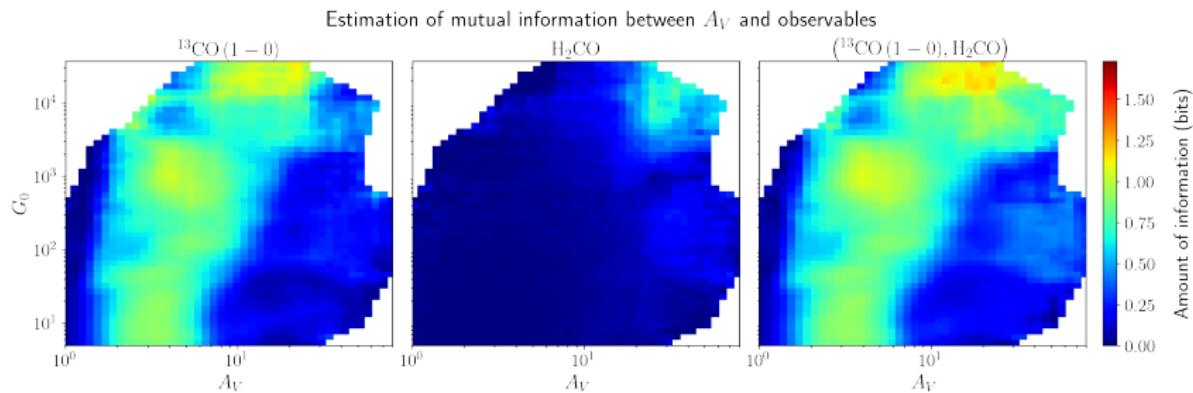
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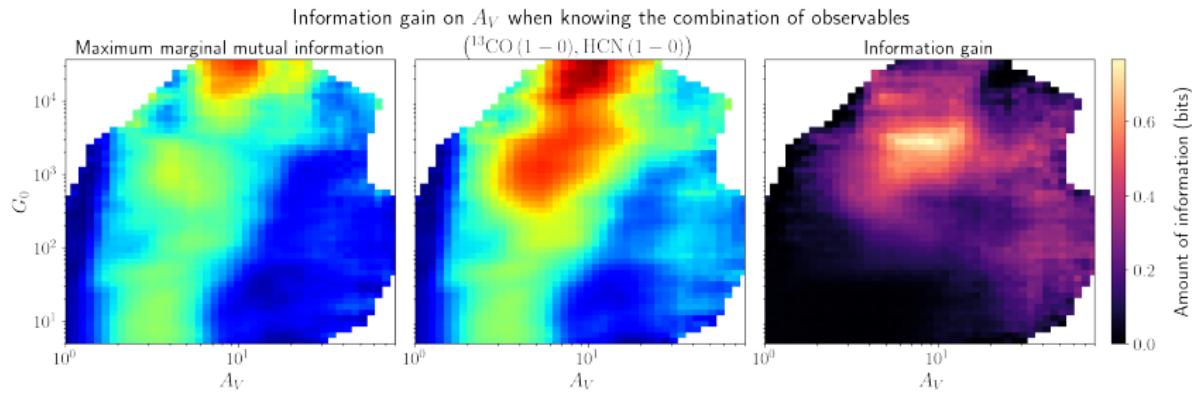
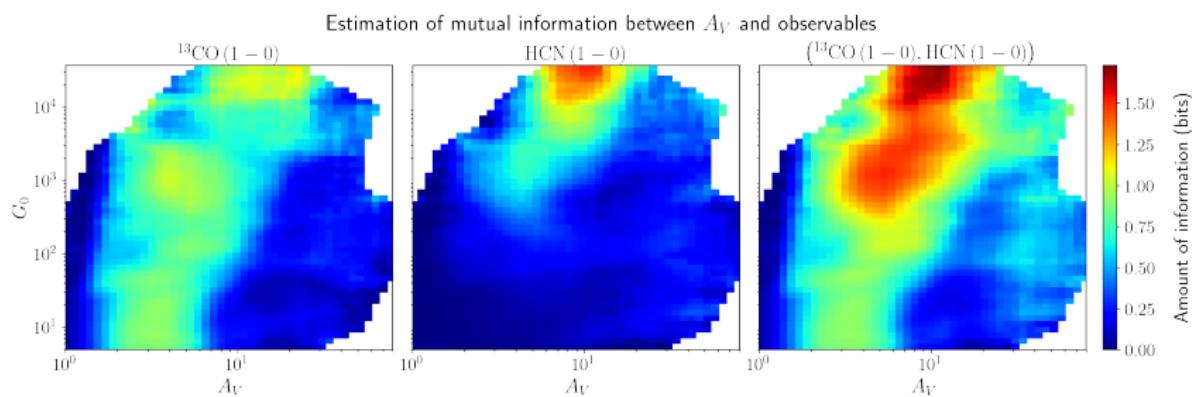
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{CCH} (1 - 0))$



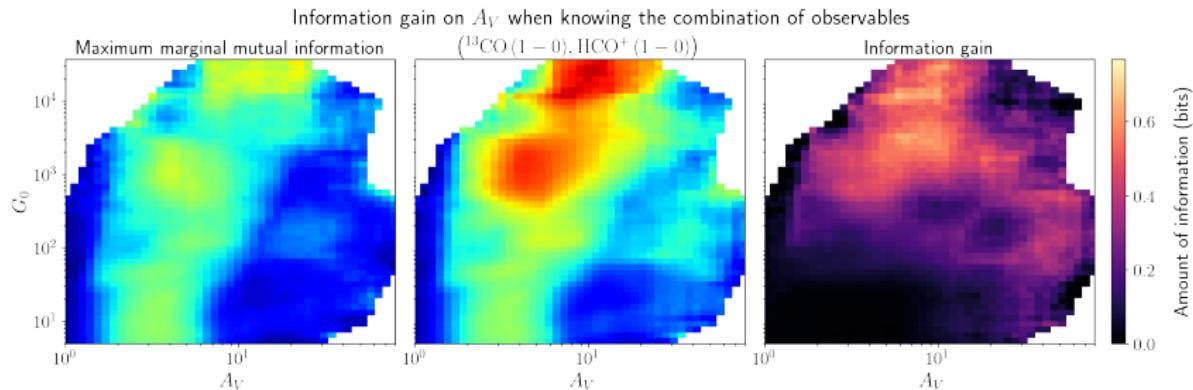
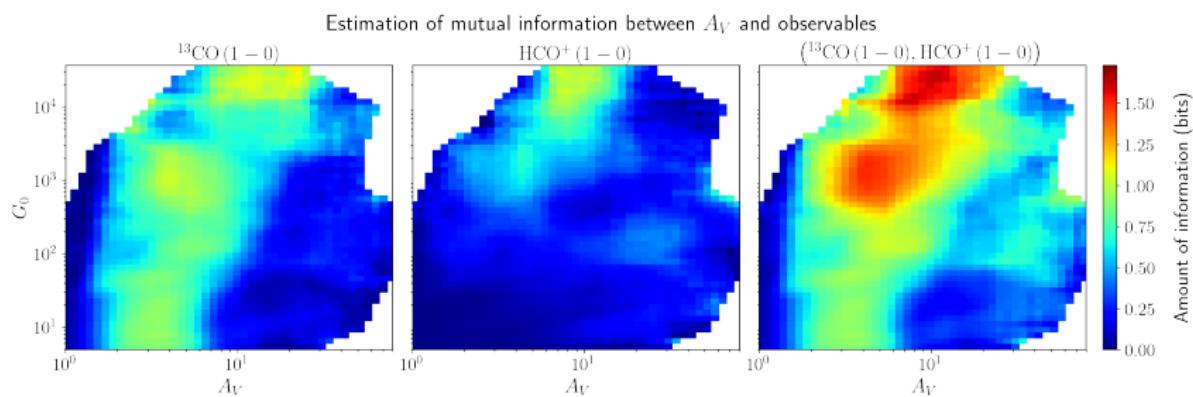
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{H}_2\text{CO})$



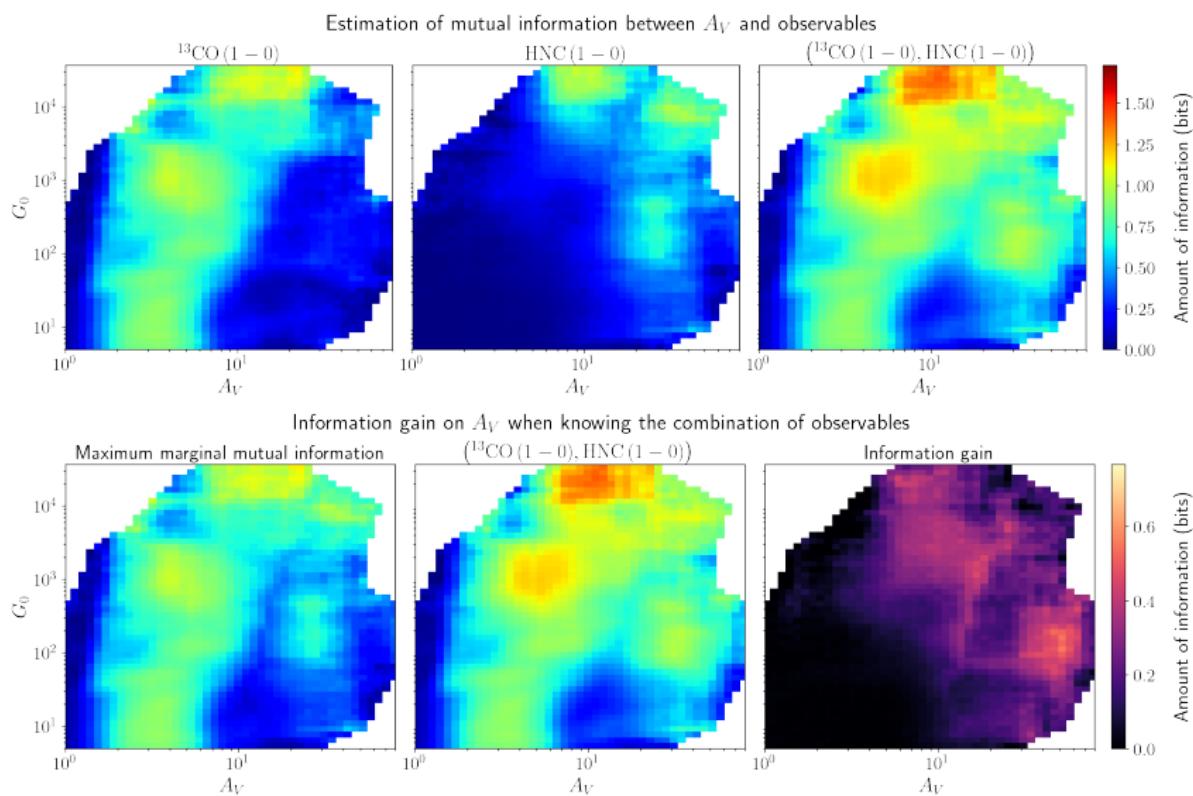
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{HCN} (1 - 0))$



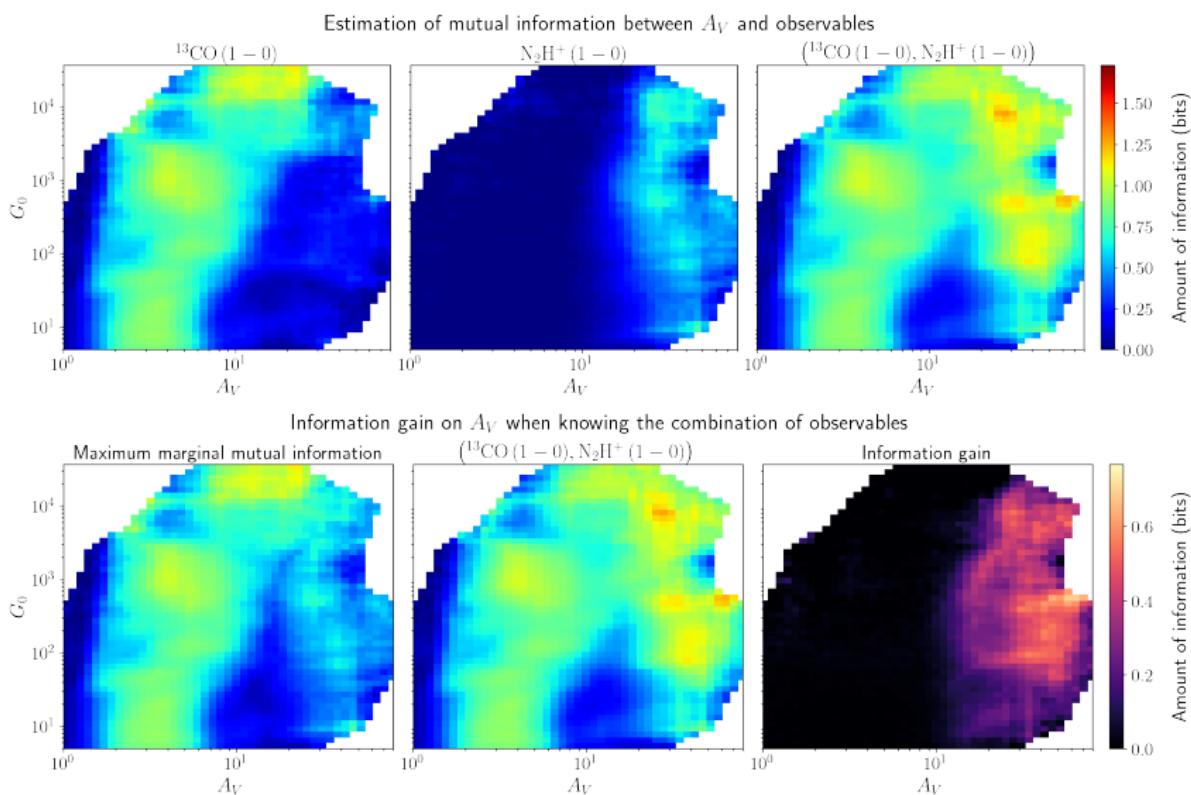
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{HCO}^+ (1 - 0))$



Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{HNC} (1 - 0))$



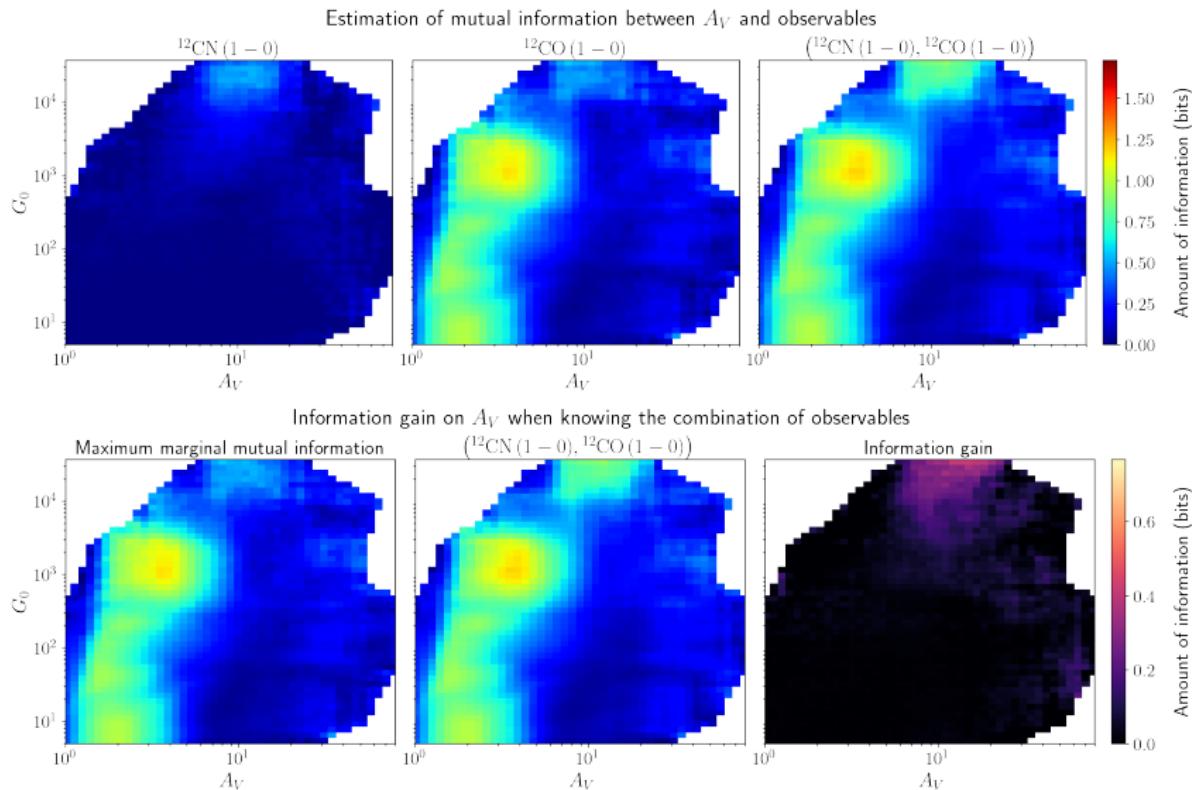
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{N}_2\text{H}^+ (1 - 0))$



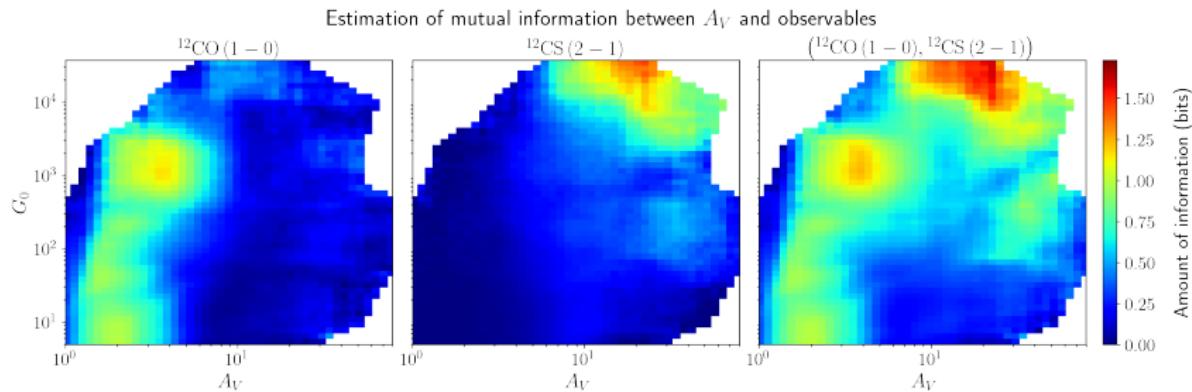
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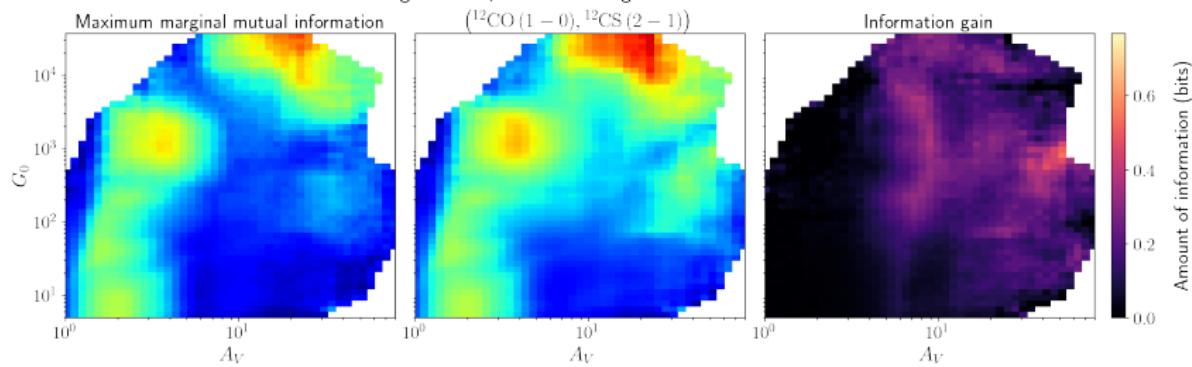
Informativity on A_V of $(^{12}\text{CN} (1 - 0), ^{12}\text{CO} (1 - 0))$



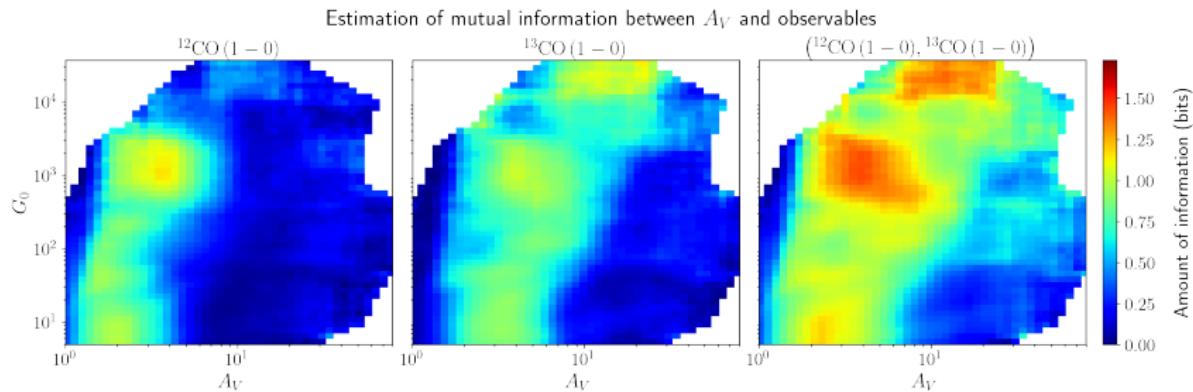
Informativity on A_V of $(^{12}\text{CO} (1 - 0), ^{12}\text{CS} (2 - 1))$



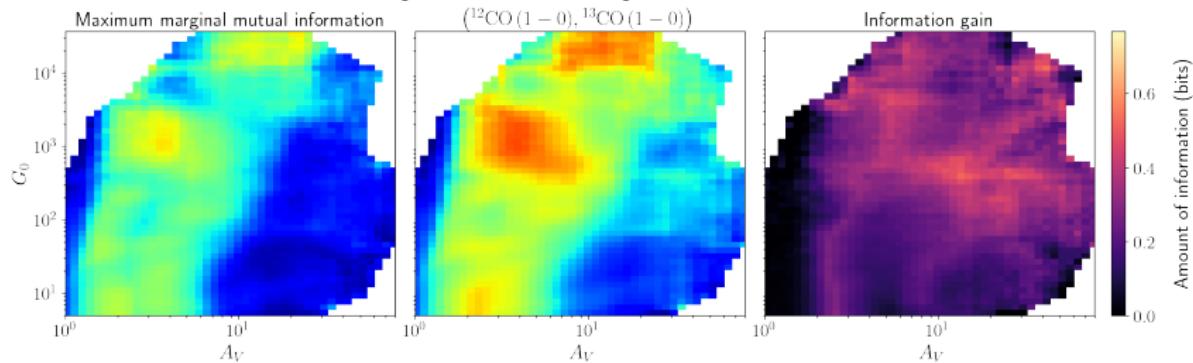
Information gain on A_V when knowing the combination of observables



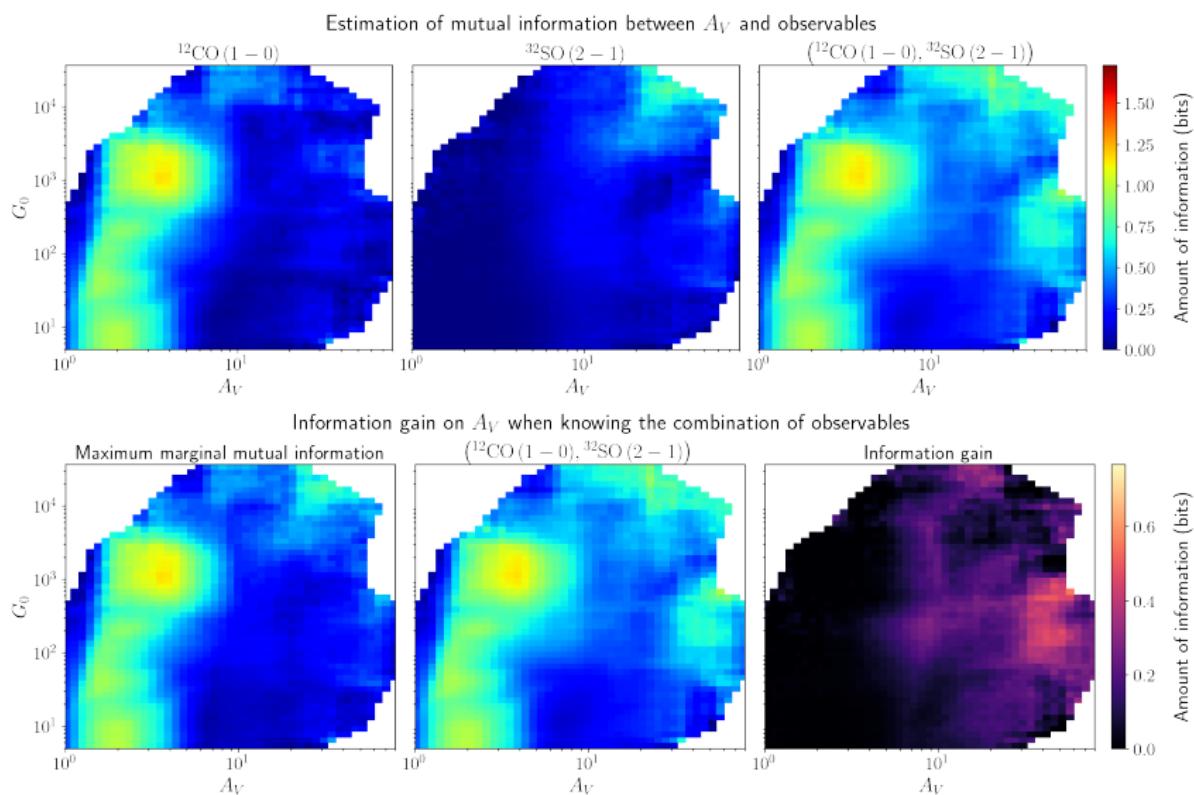
Informativity on A_V of $(^{12}\text{CO} (1 - 0), ^{13}\text{CO} (1 - 0))$



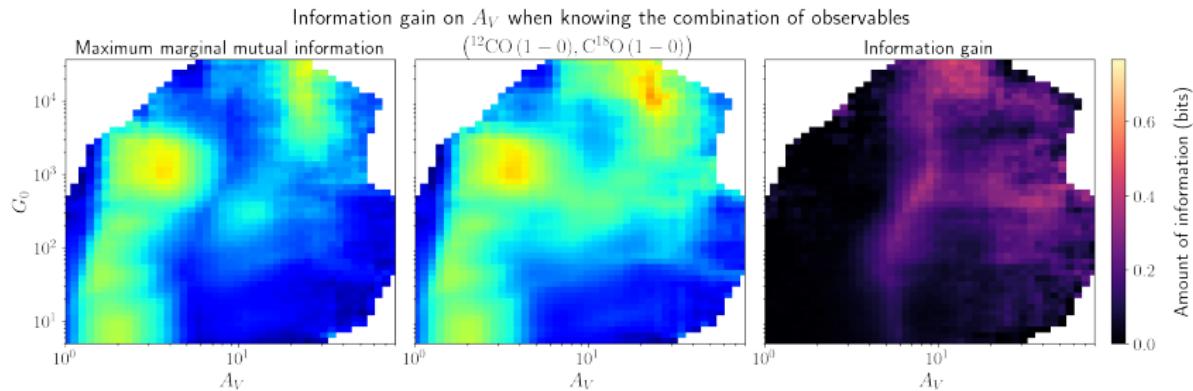
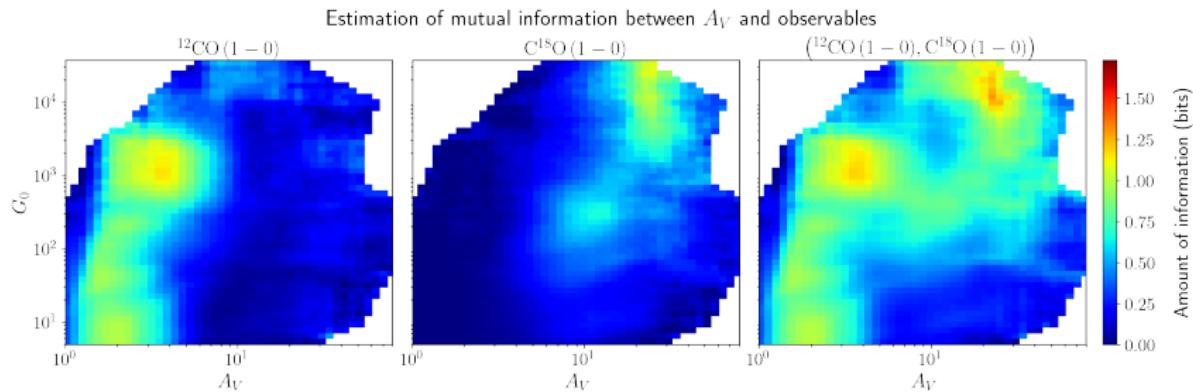
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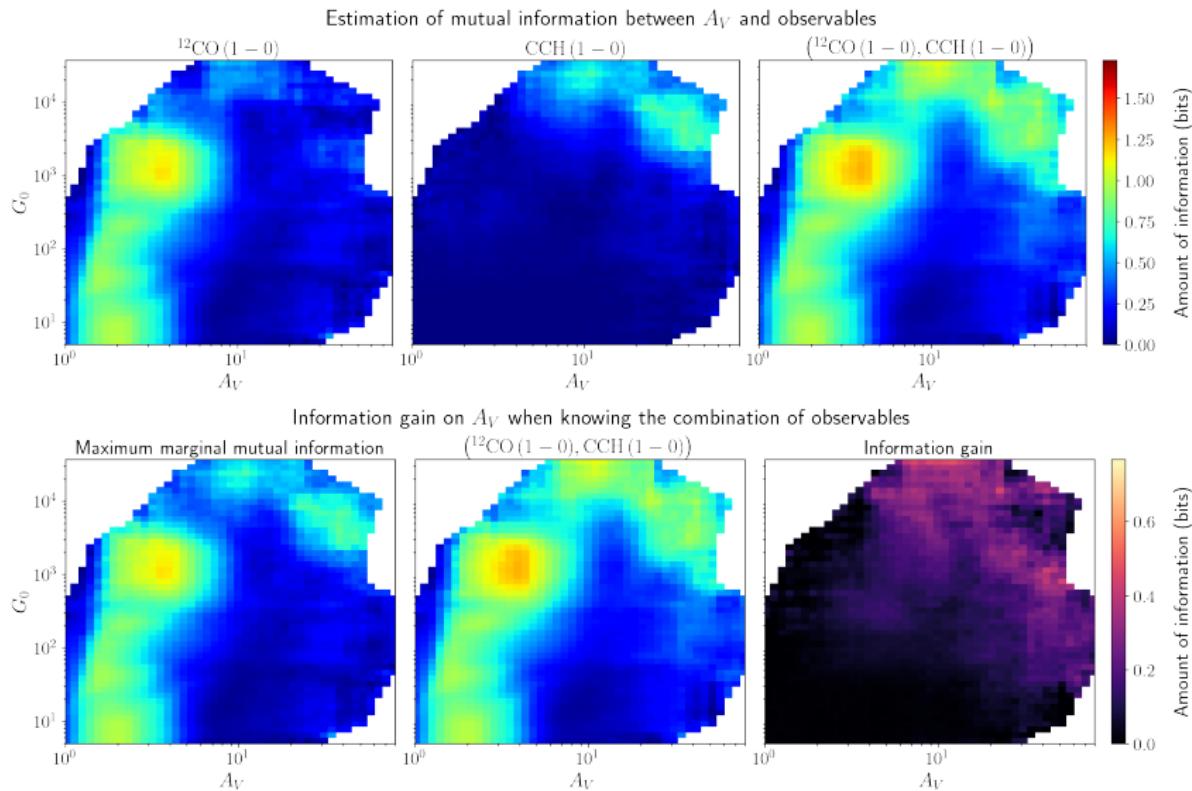
Informativity on A_V of $(^{12}\text{CO} (1 - 0), ^{32}\text{SO} (2 - 1))$



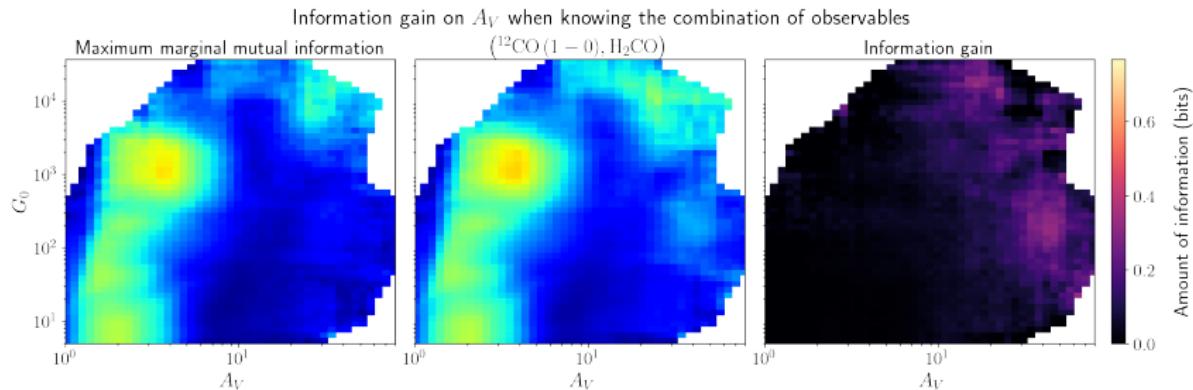
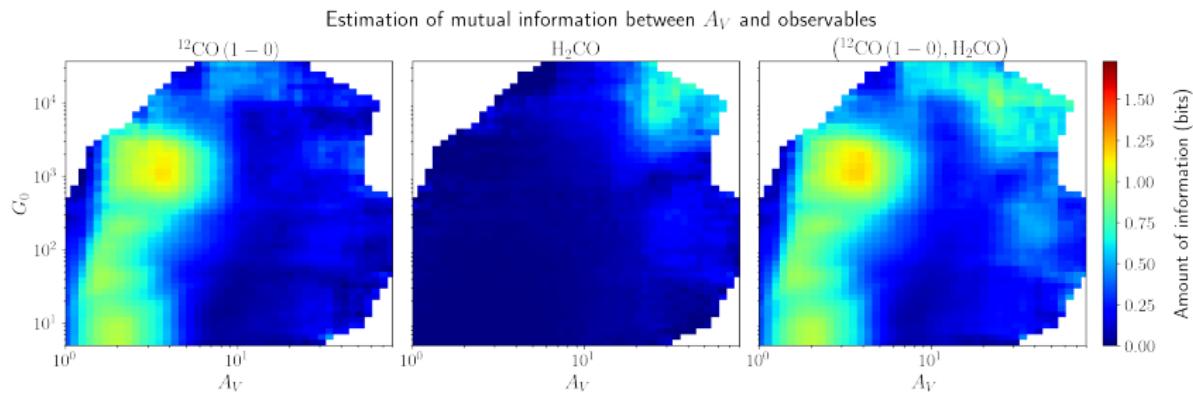
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{C}^{18}\text{O} (1 - 0))$



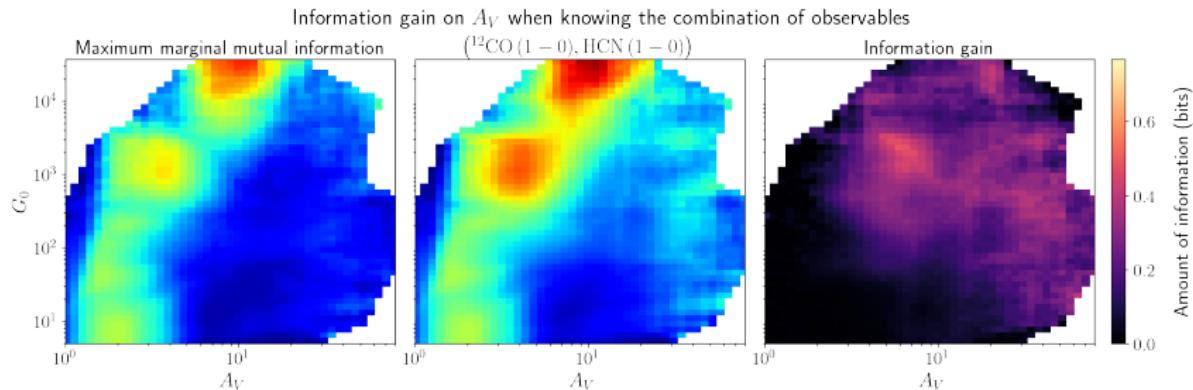
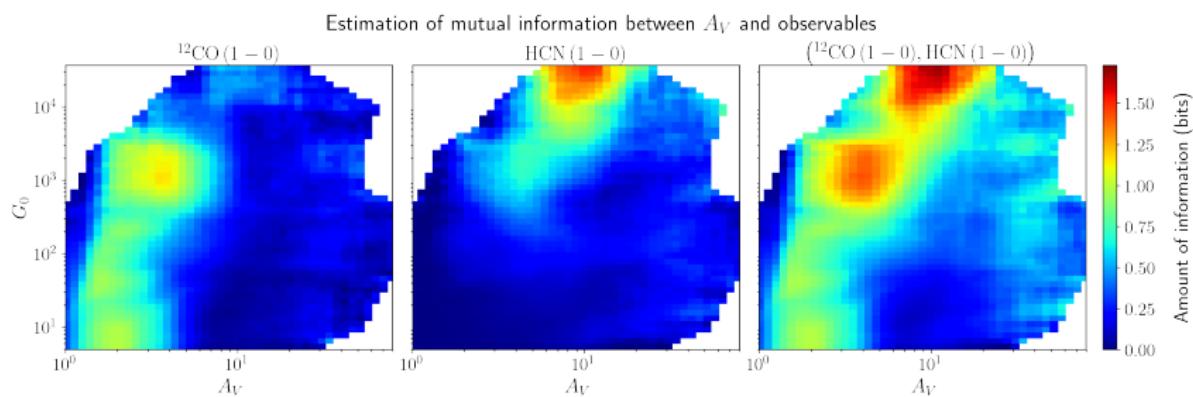
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{CCH} (1 - 0))$



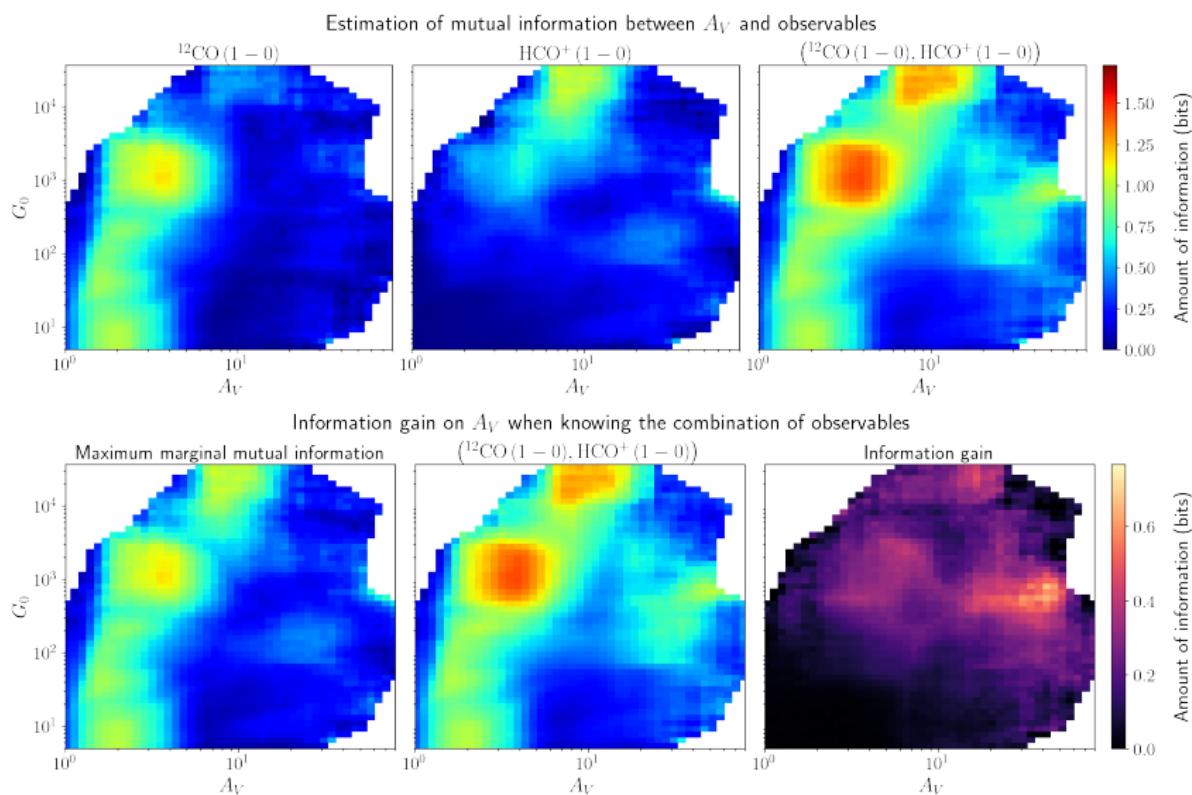
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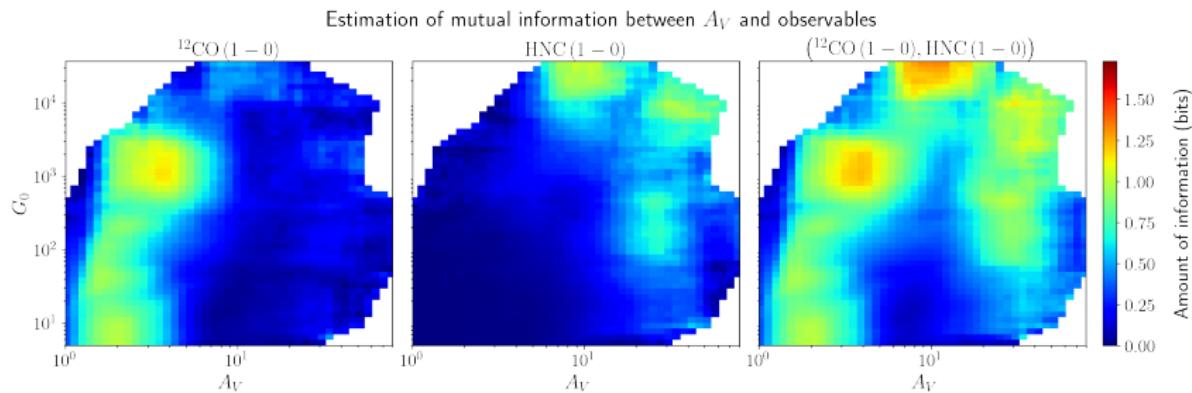
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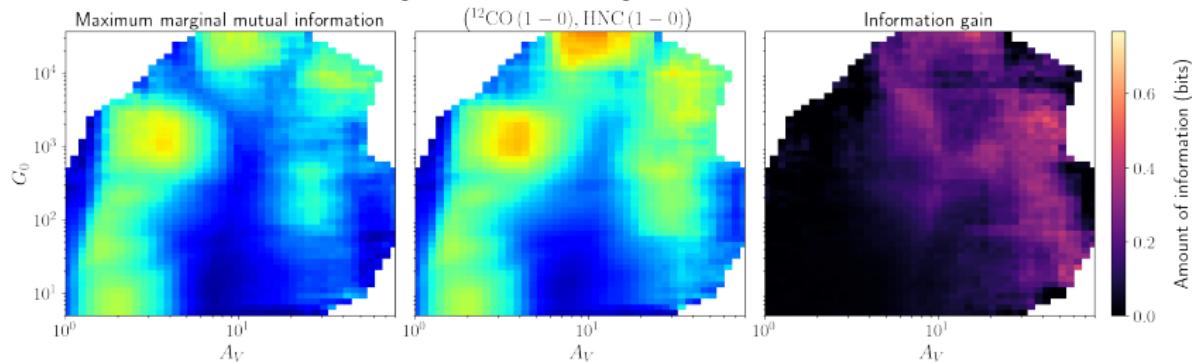
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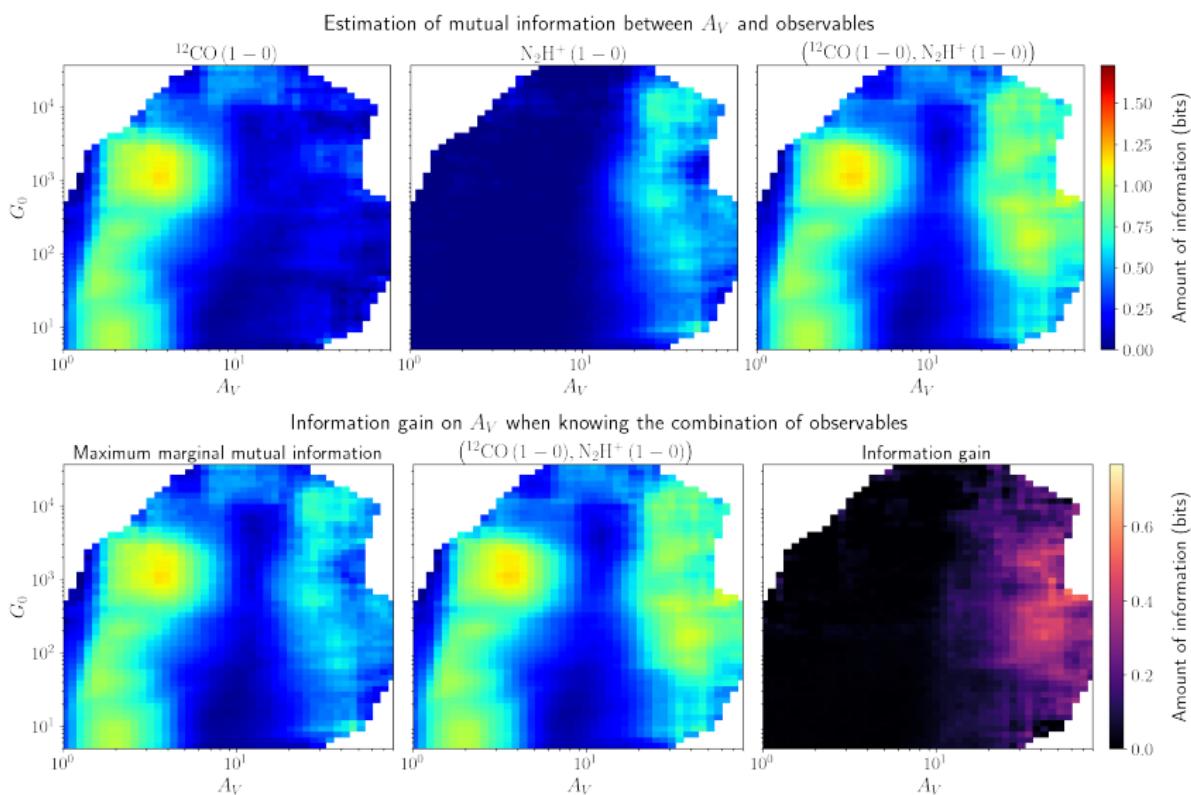
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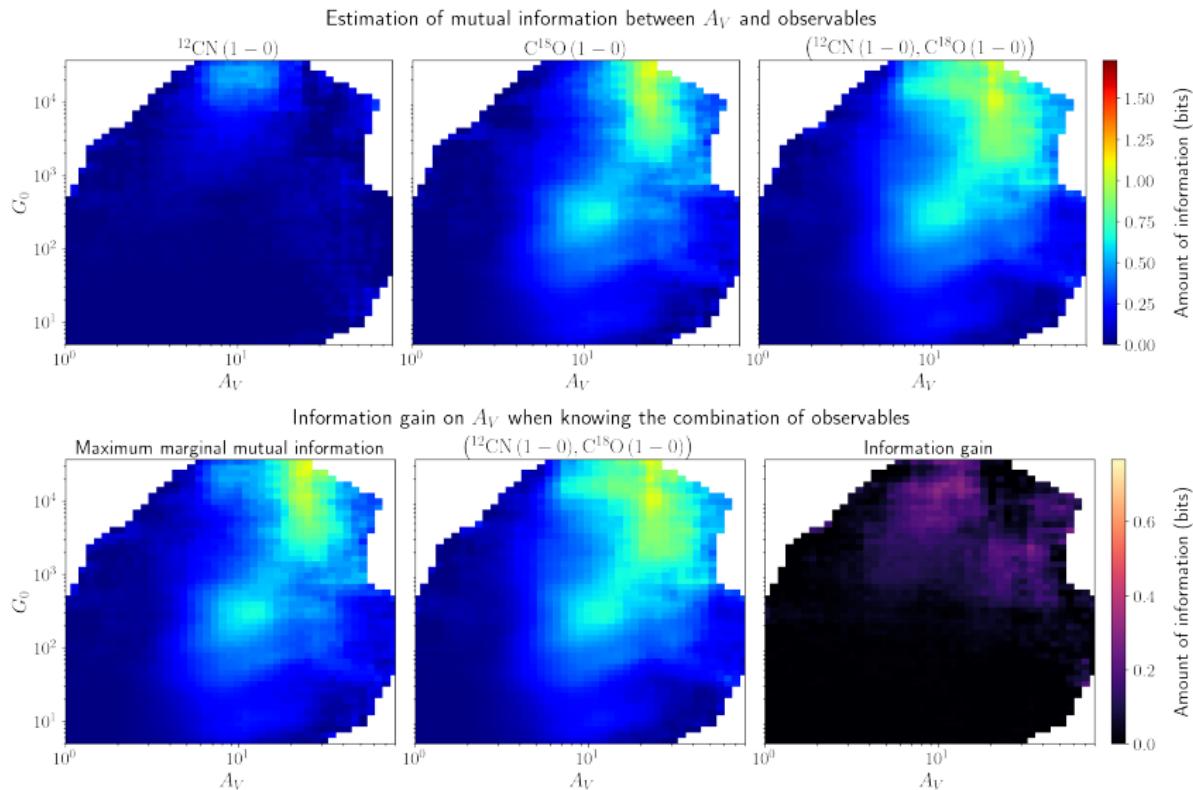
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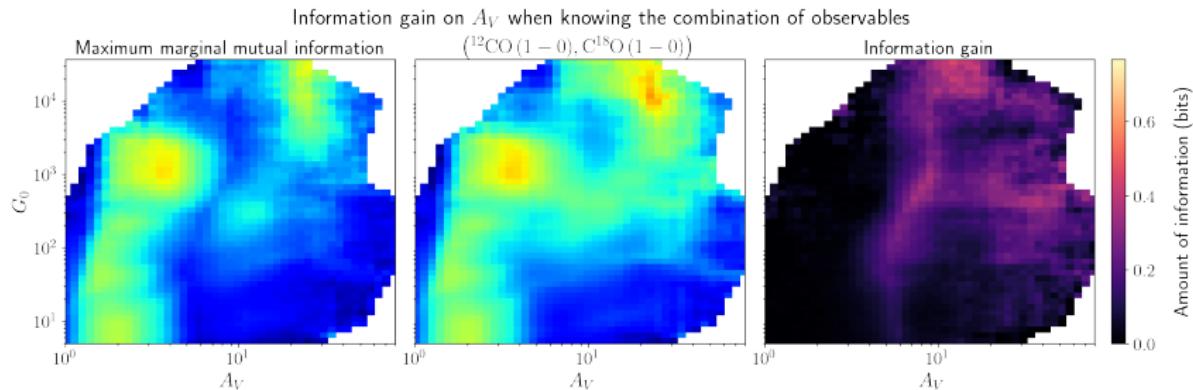
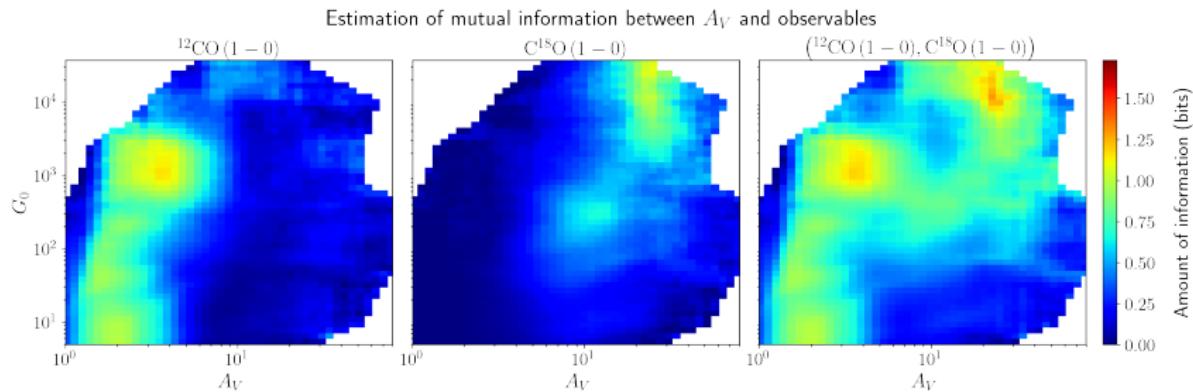
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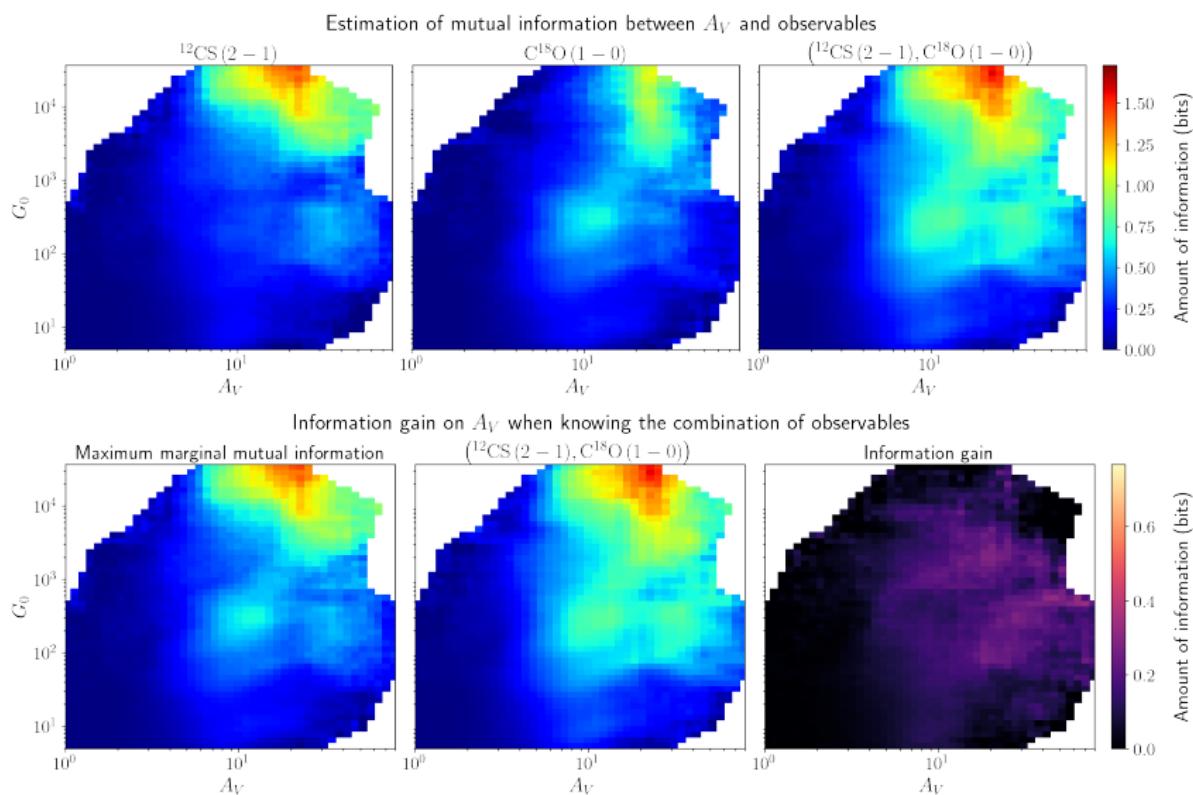
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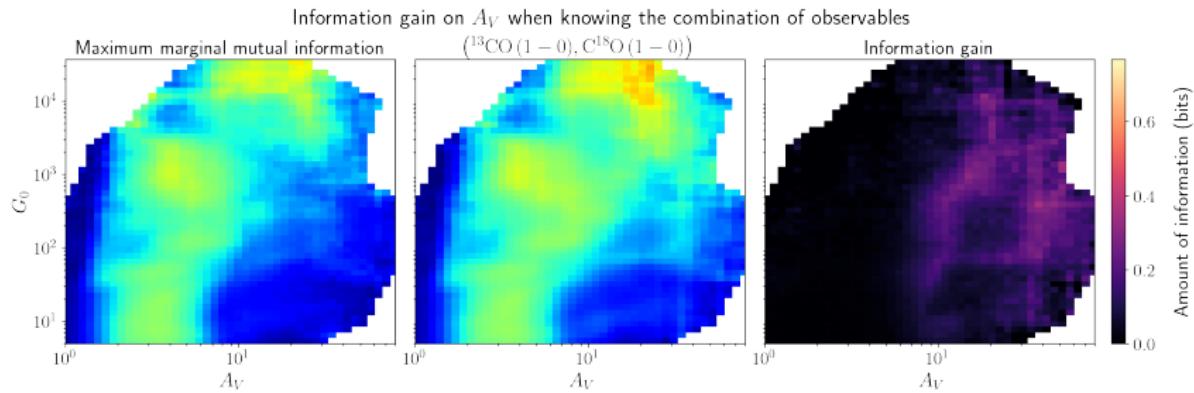
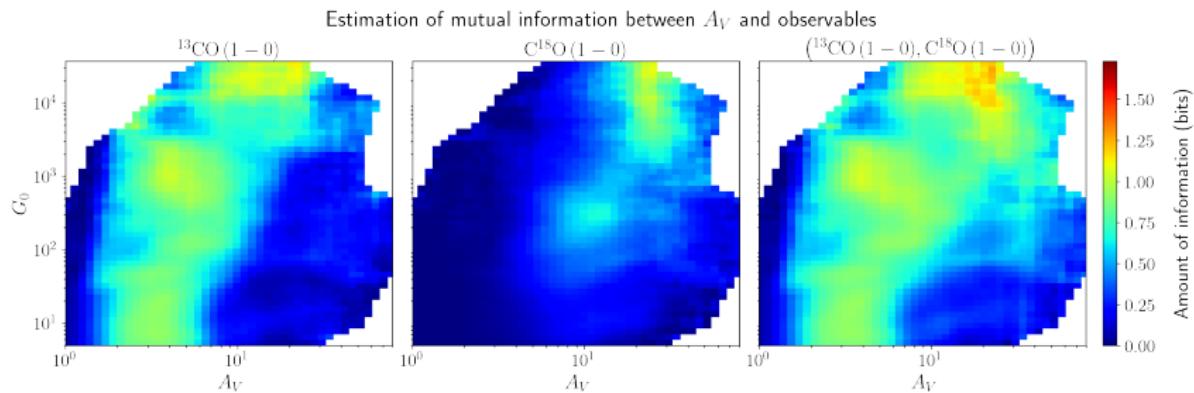
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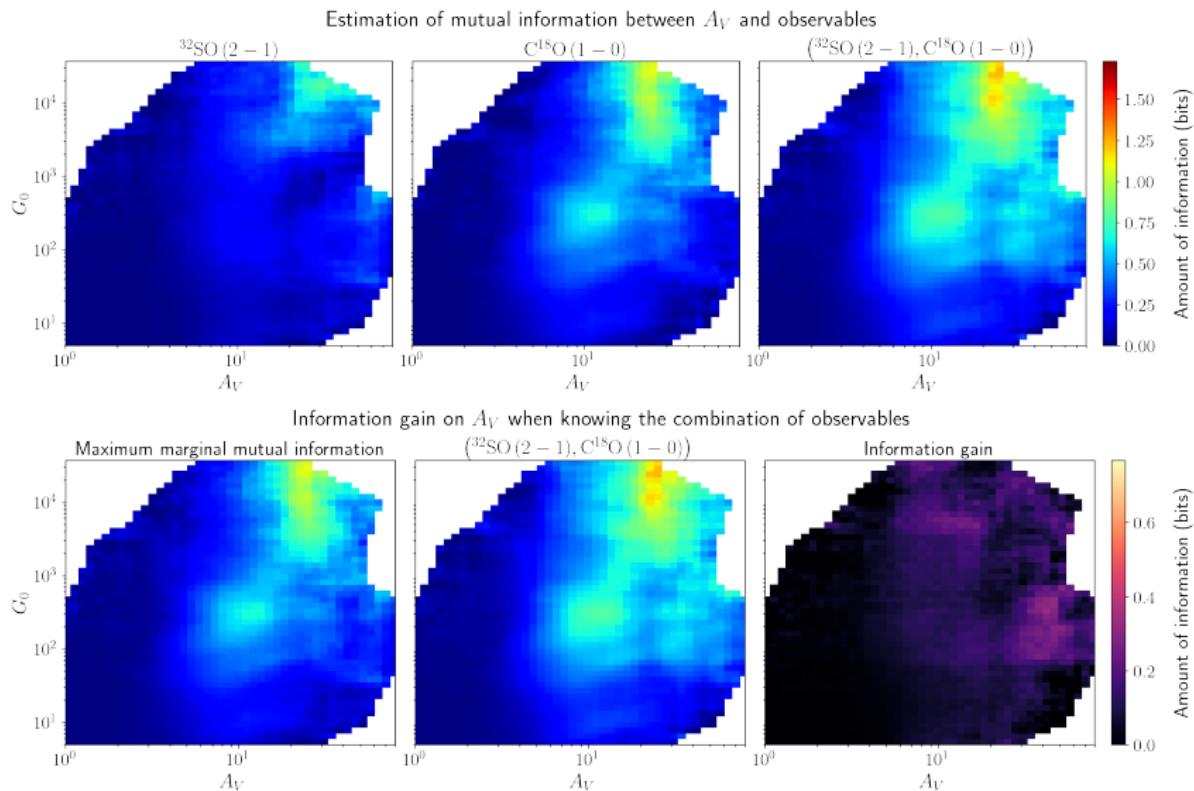
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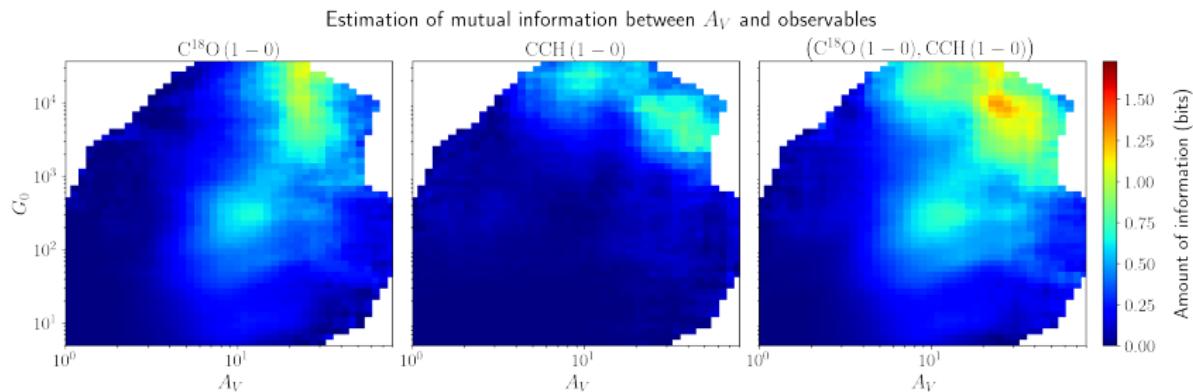
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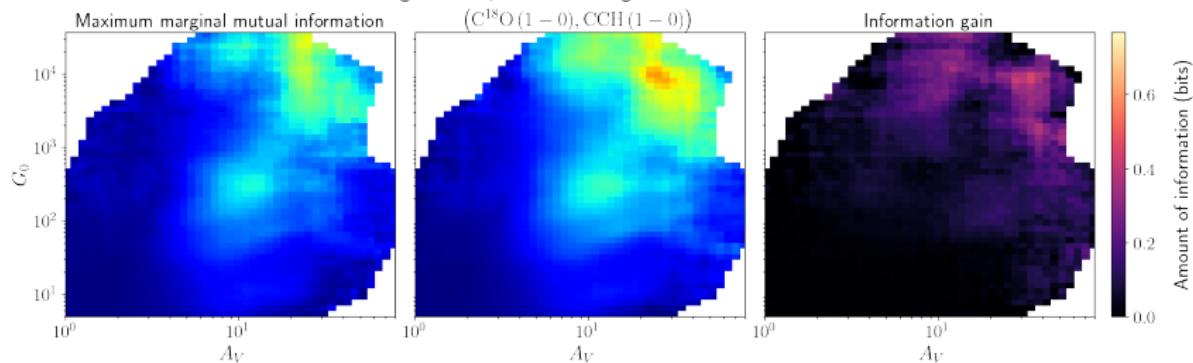
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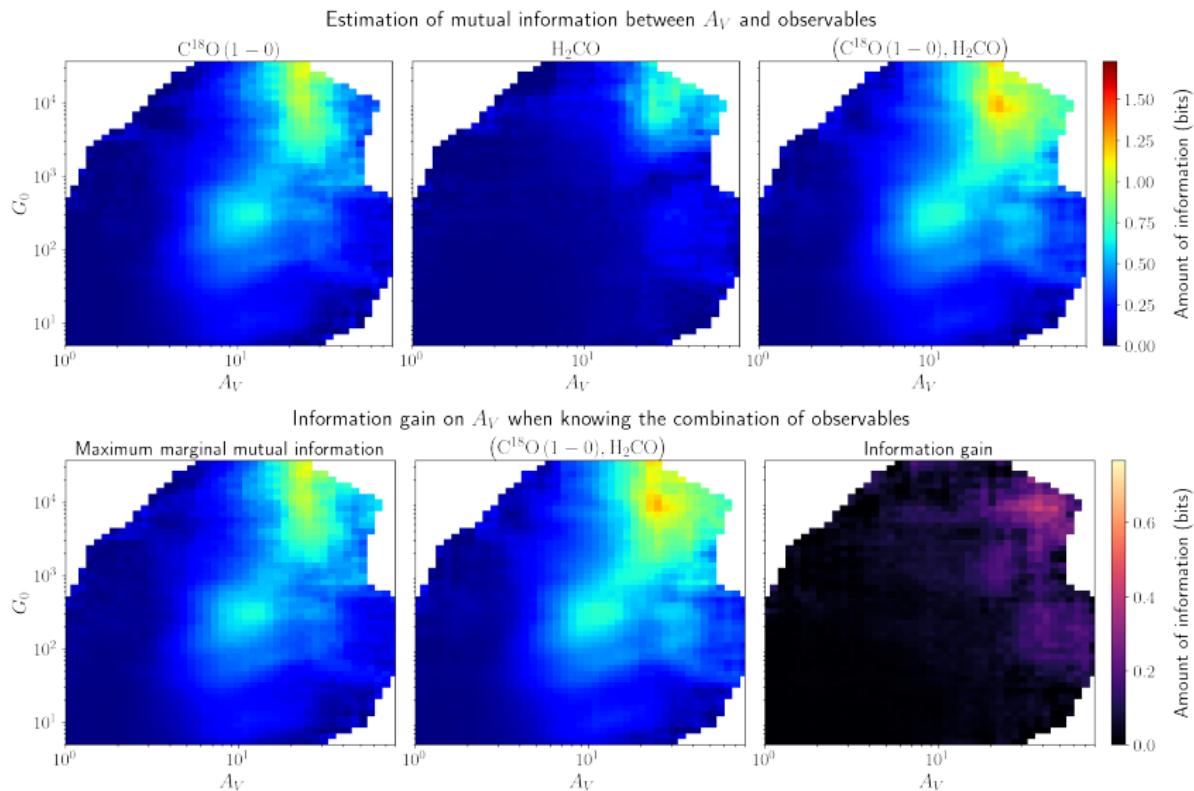
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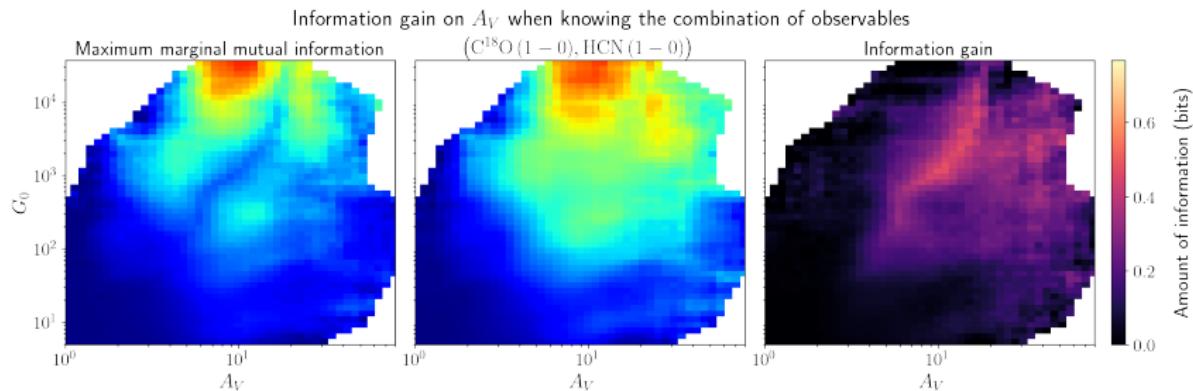
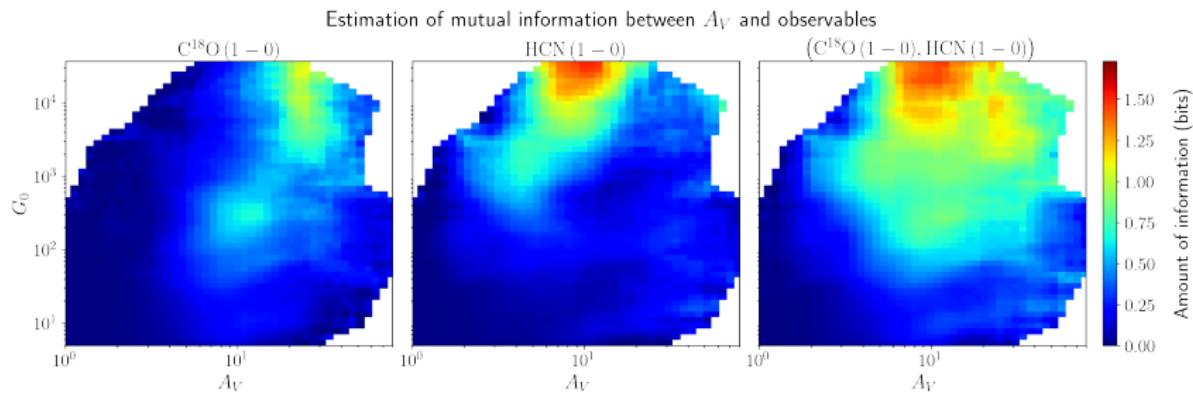
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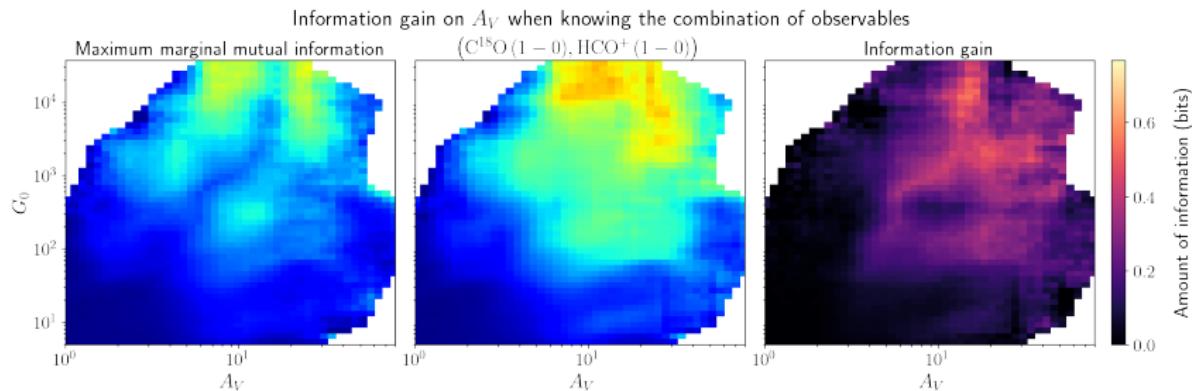
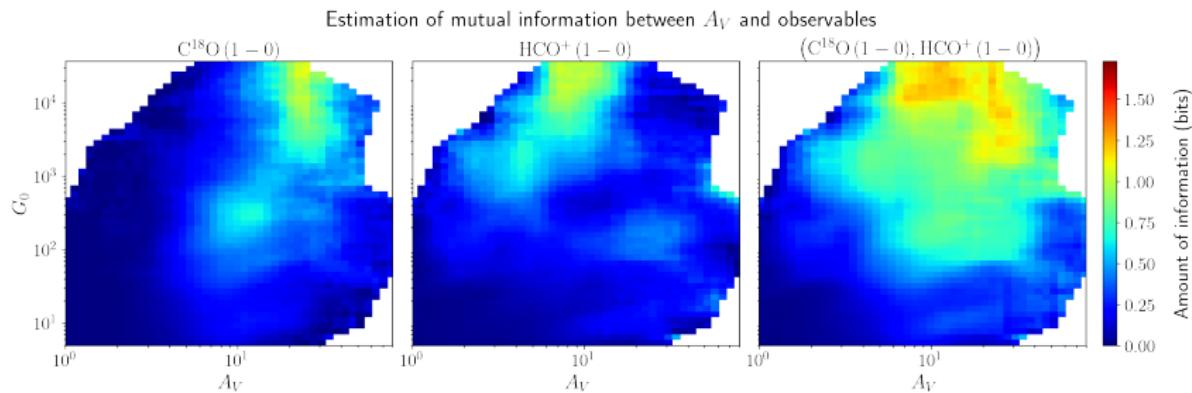
Informativity on A_V of $(C^{18}O(1 - 0), H_2CO)$



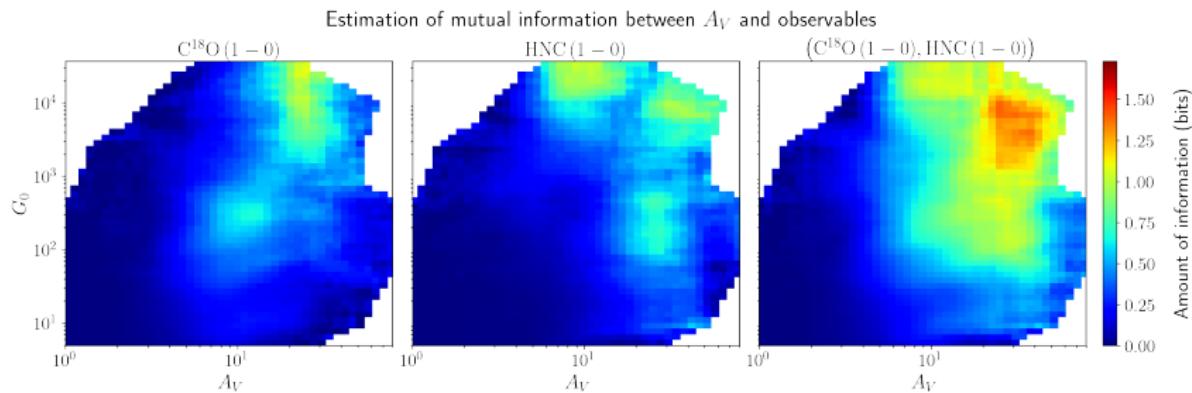
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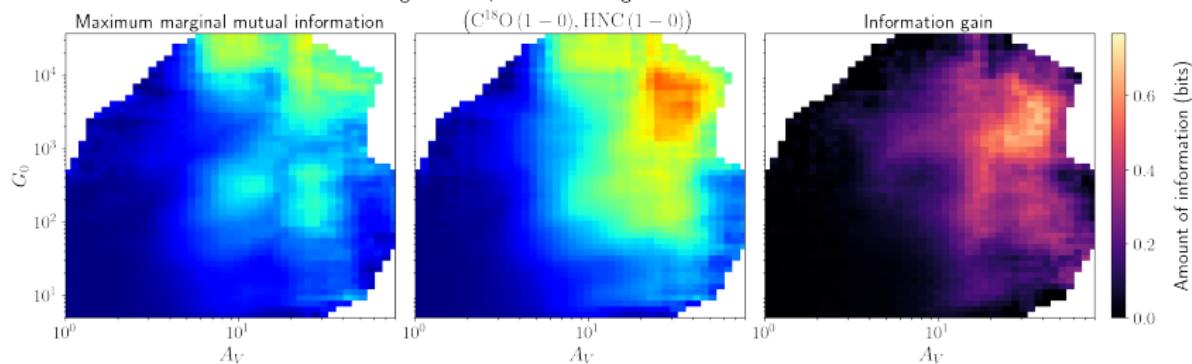
Informativity on A_V of $(C^{18}O(1 - 0), HCO^+(1 - 0))$



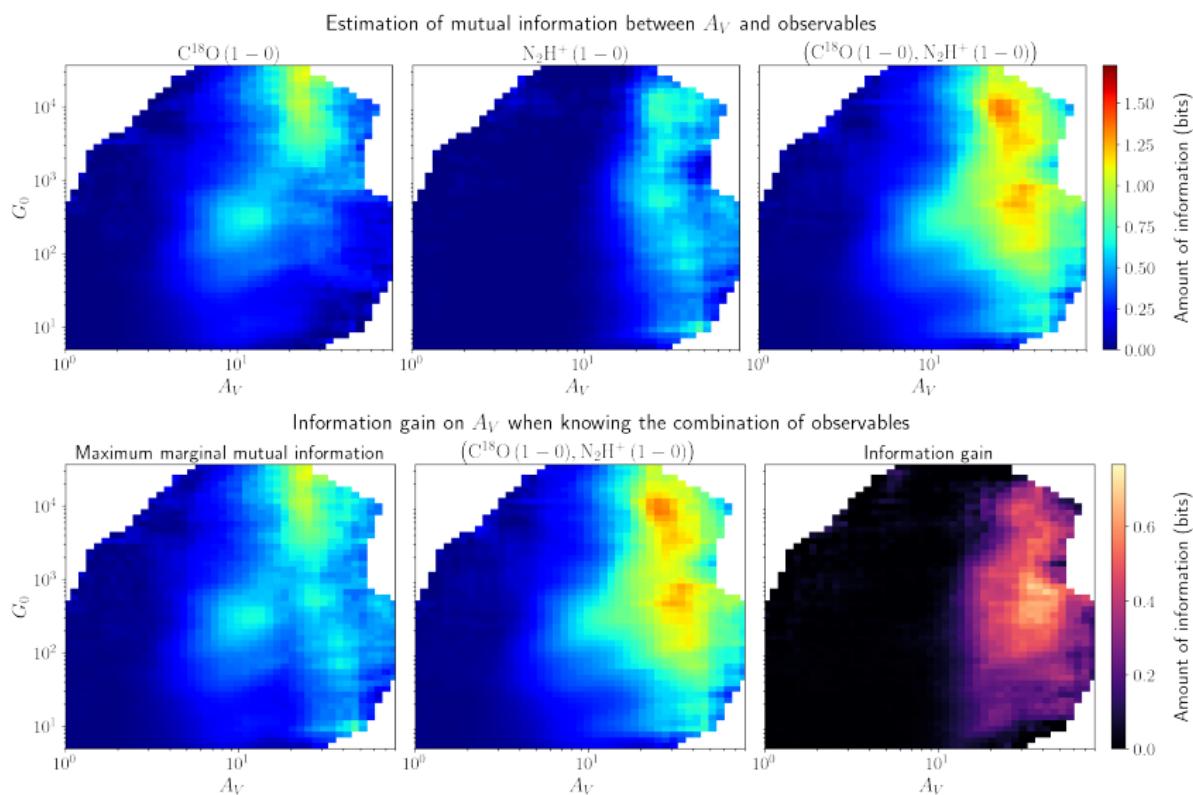
Informativity on A_V of $(C^{18}O(1-0), HNC(1-0))$



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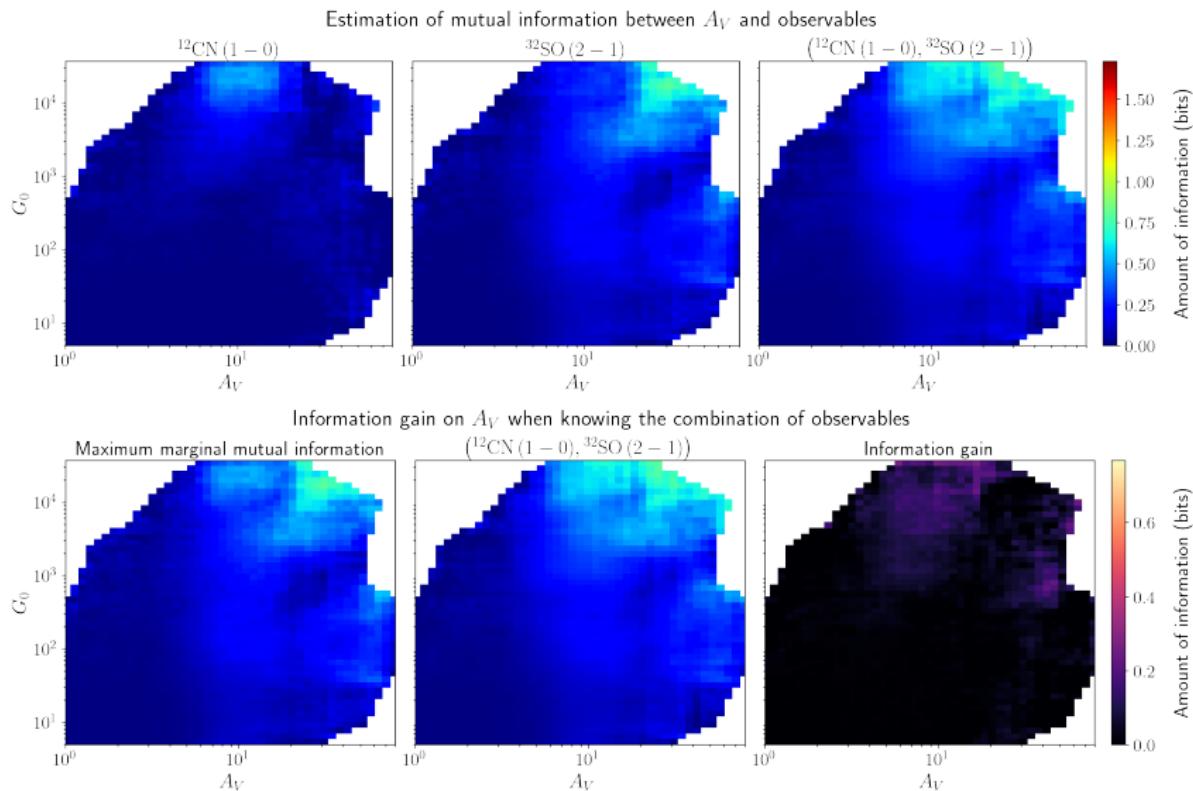
Informativity on A_V of $(C^{18}O(1-0), N_2H^+(1-0))$



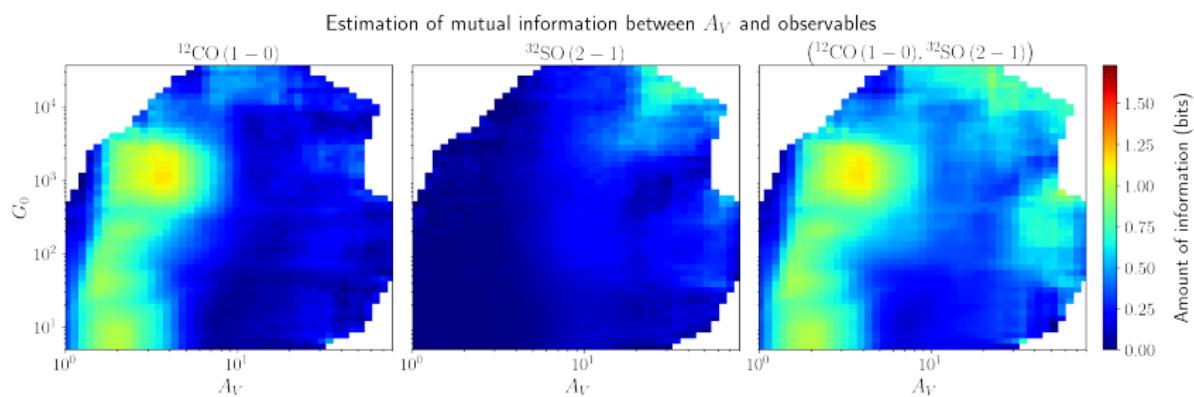
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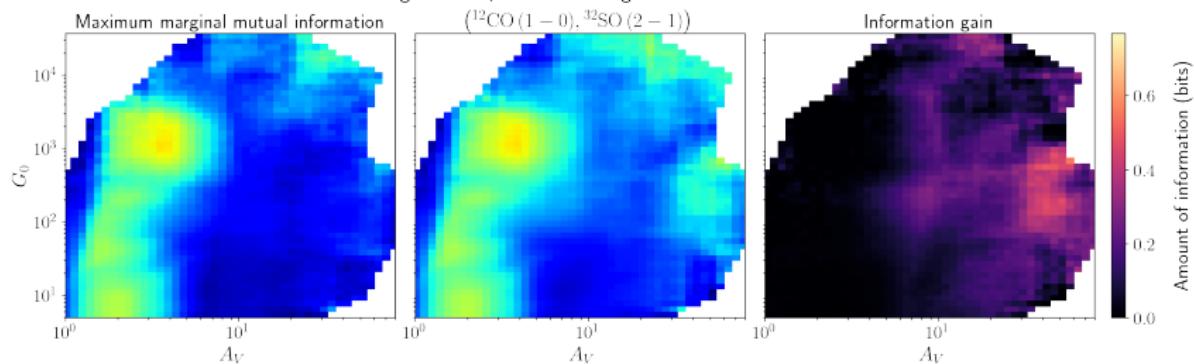
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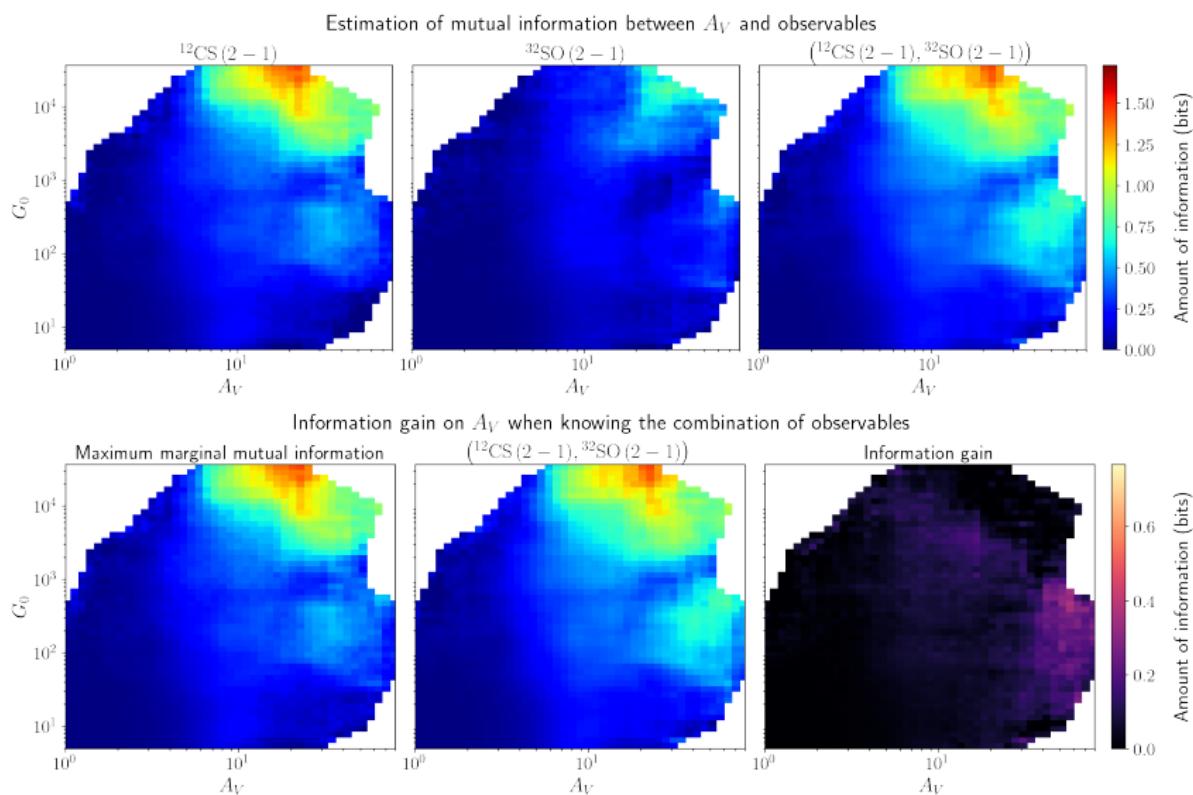
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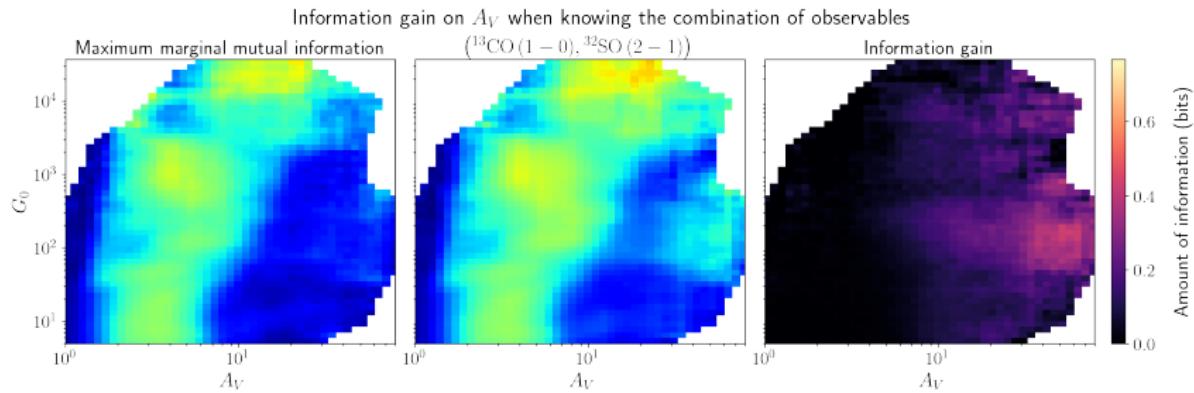
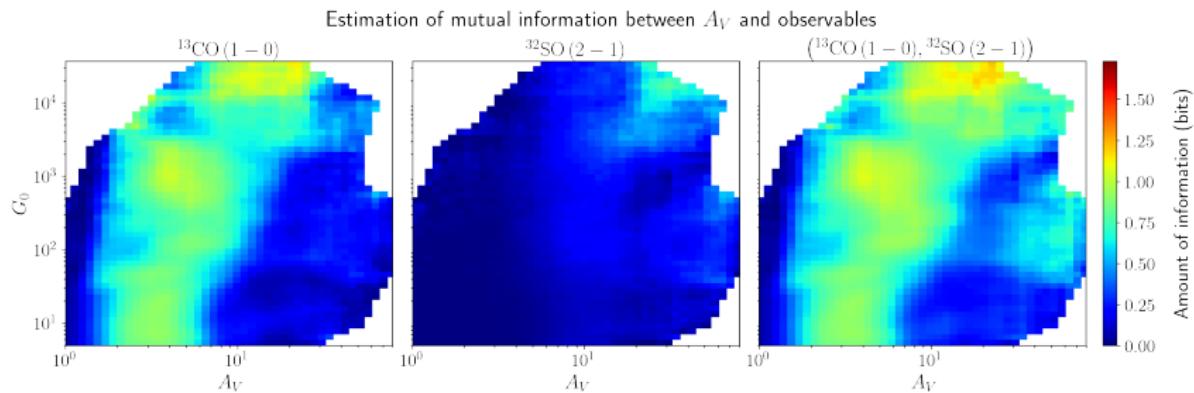
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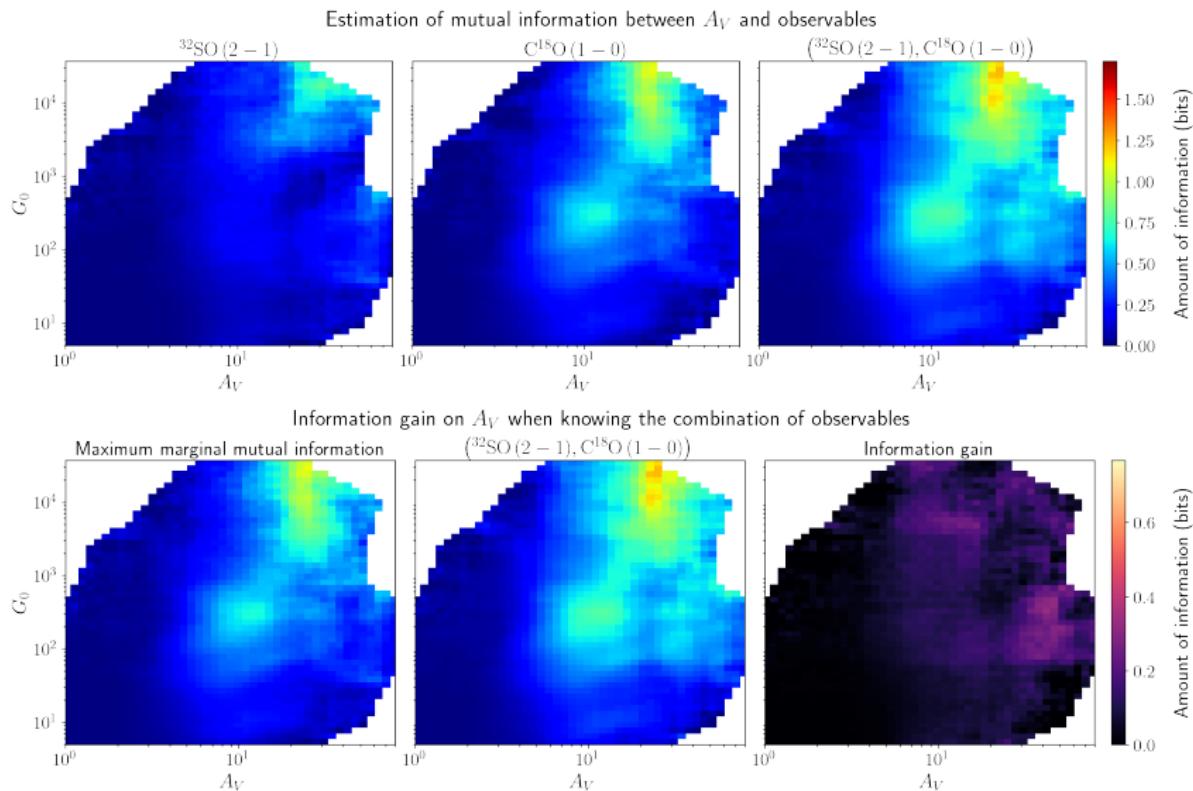
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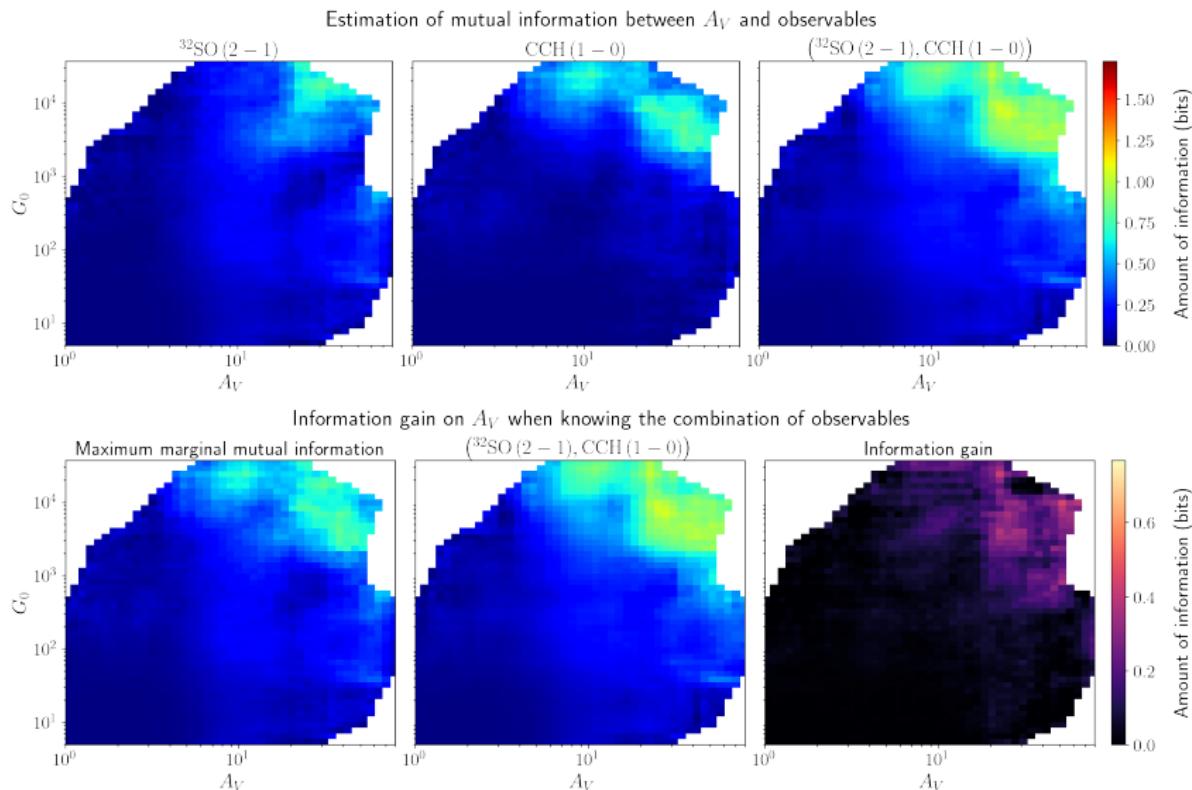
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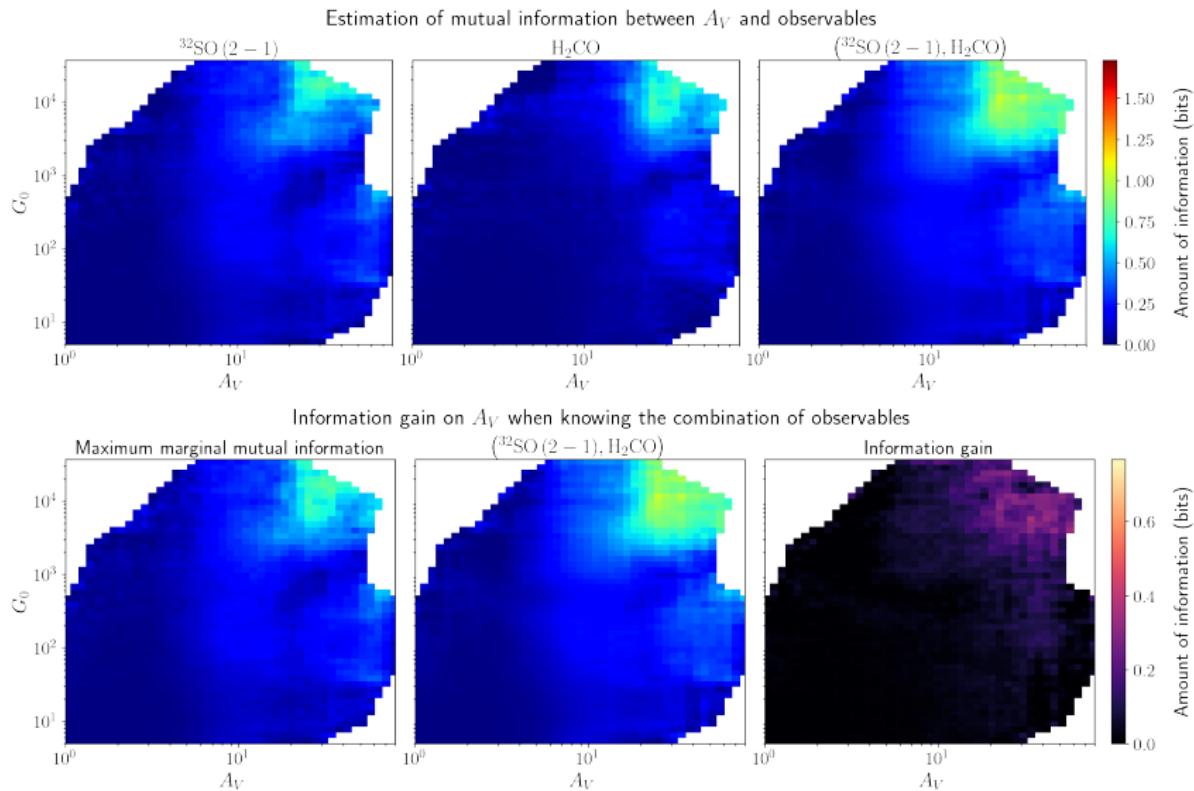
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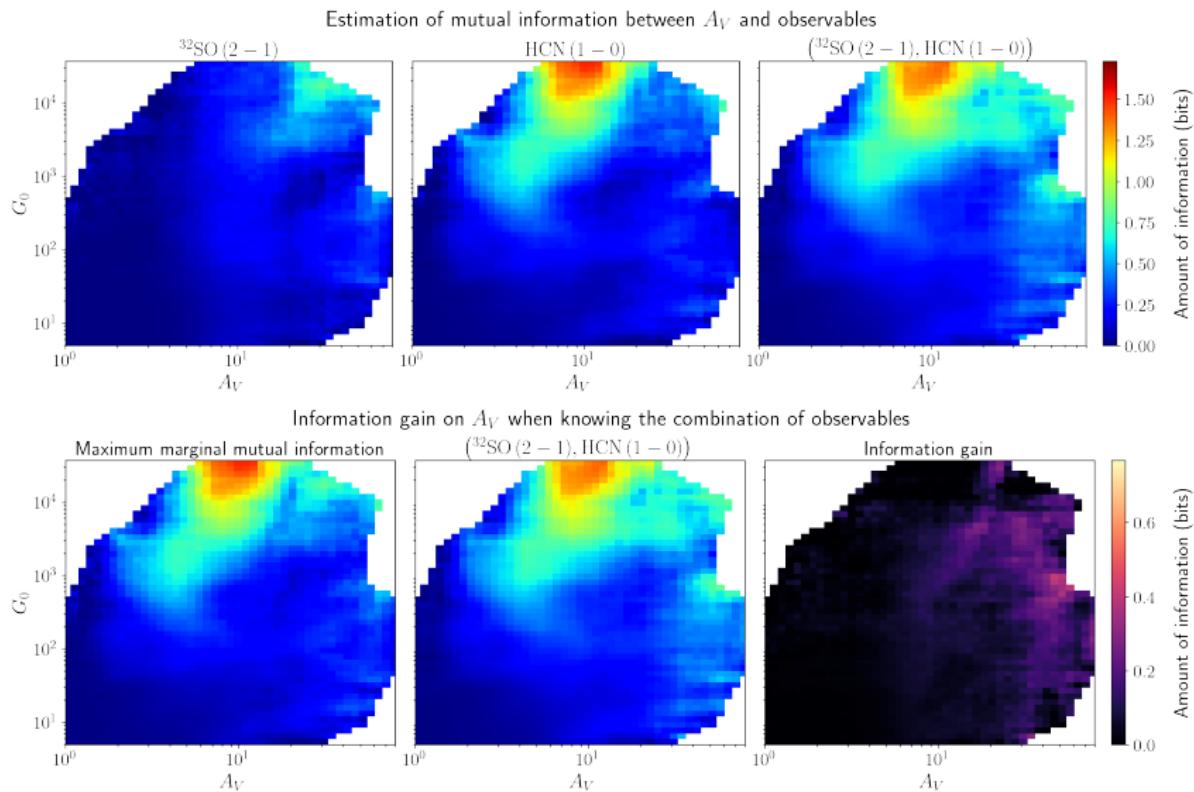
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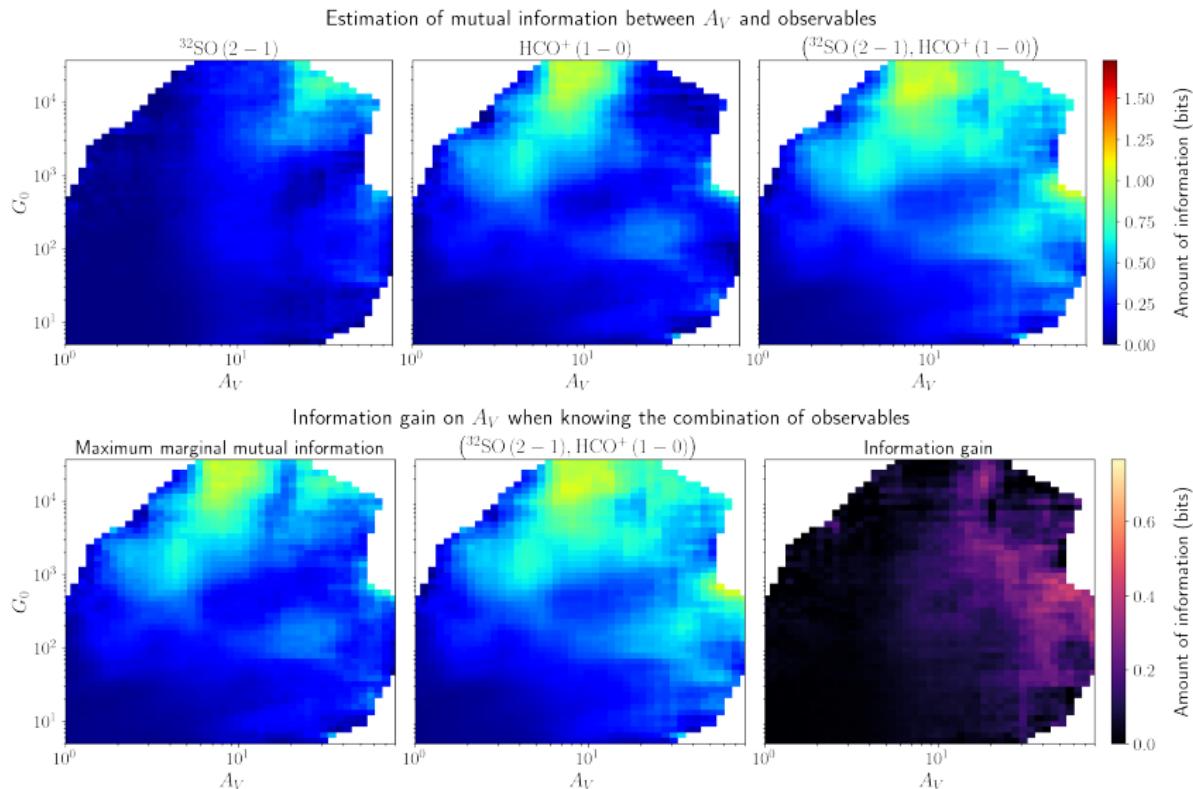
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{H}_2\text{CO})$



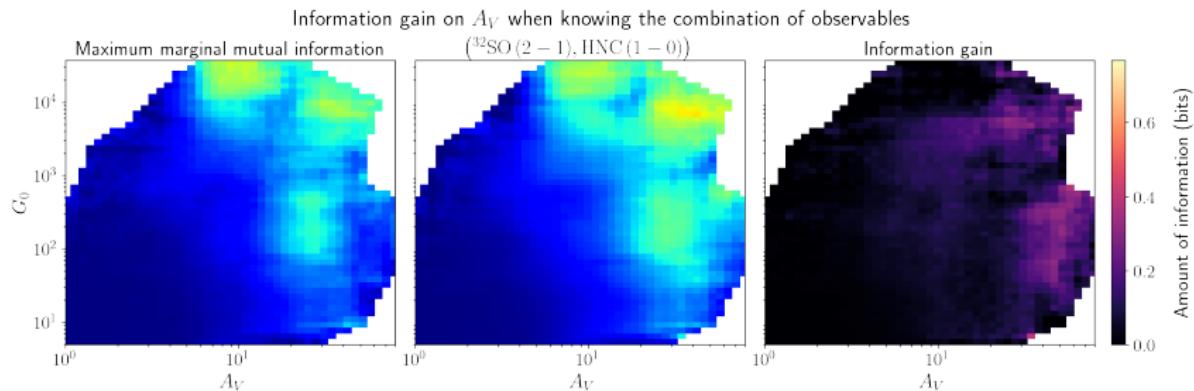
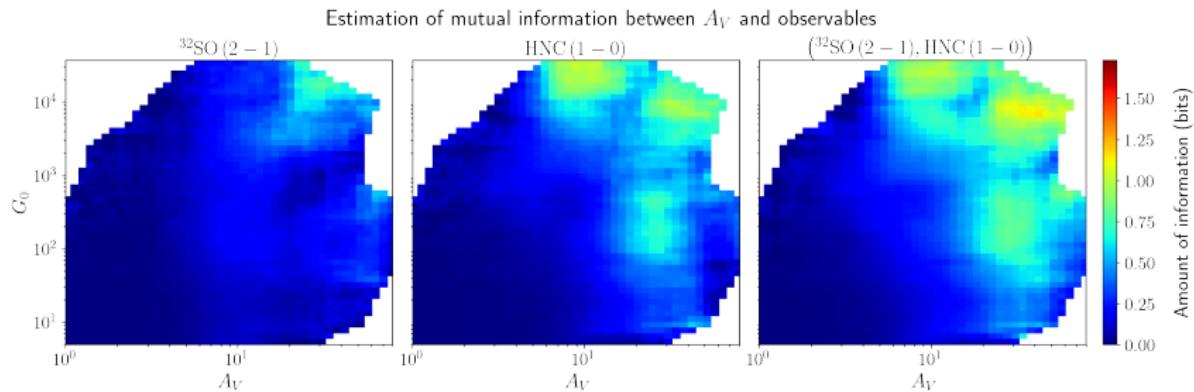
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{HCN} (1 - 0))$



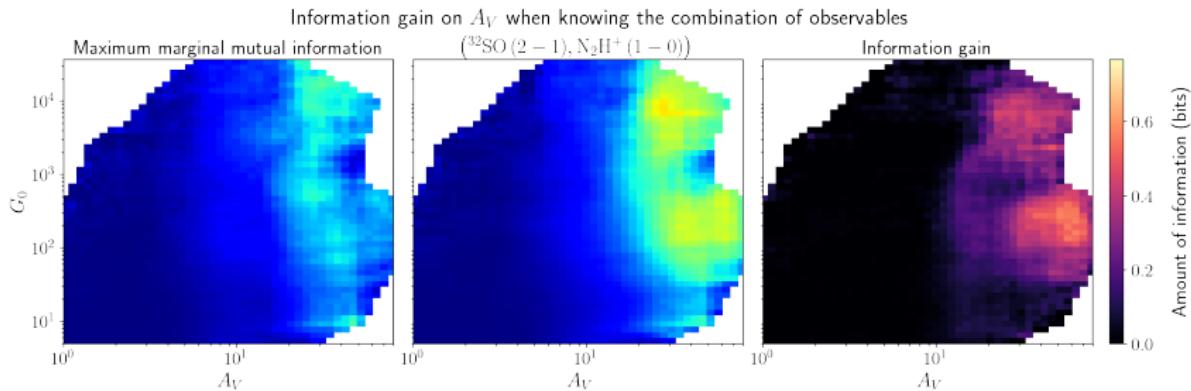
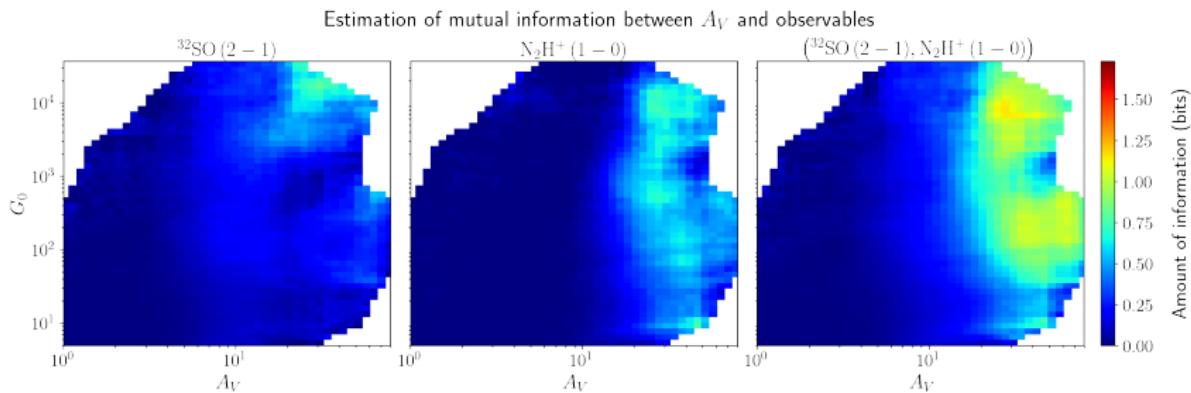
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{HCO}^+ (1 - 0))$



Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{HNC} (1 - 0))$



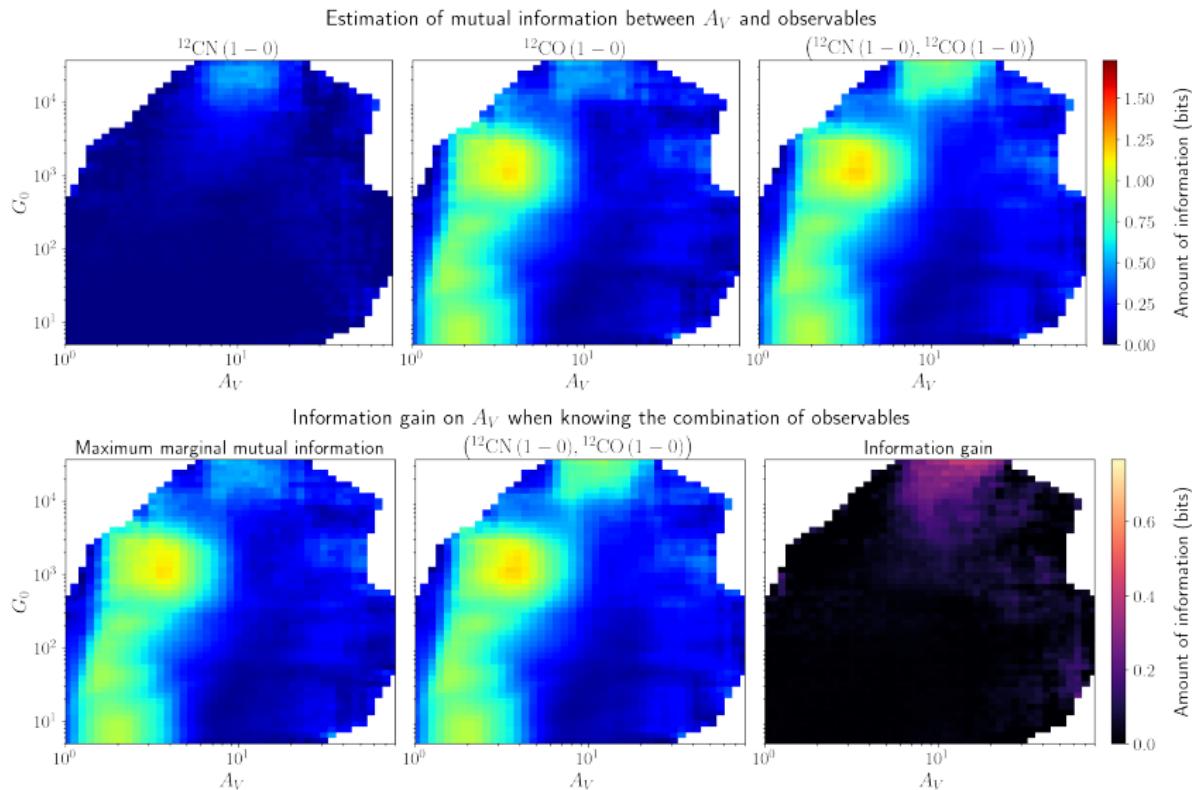
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{N}_2\text{H}^+ (1 - 0))$



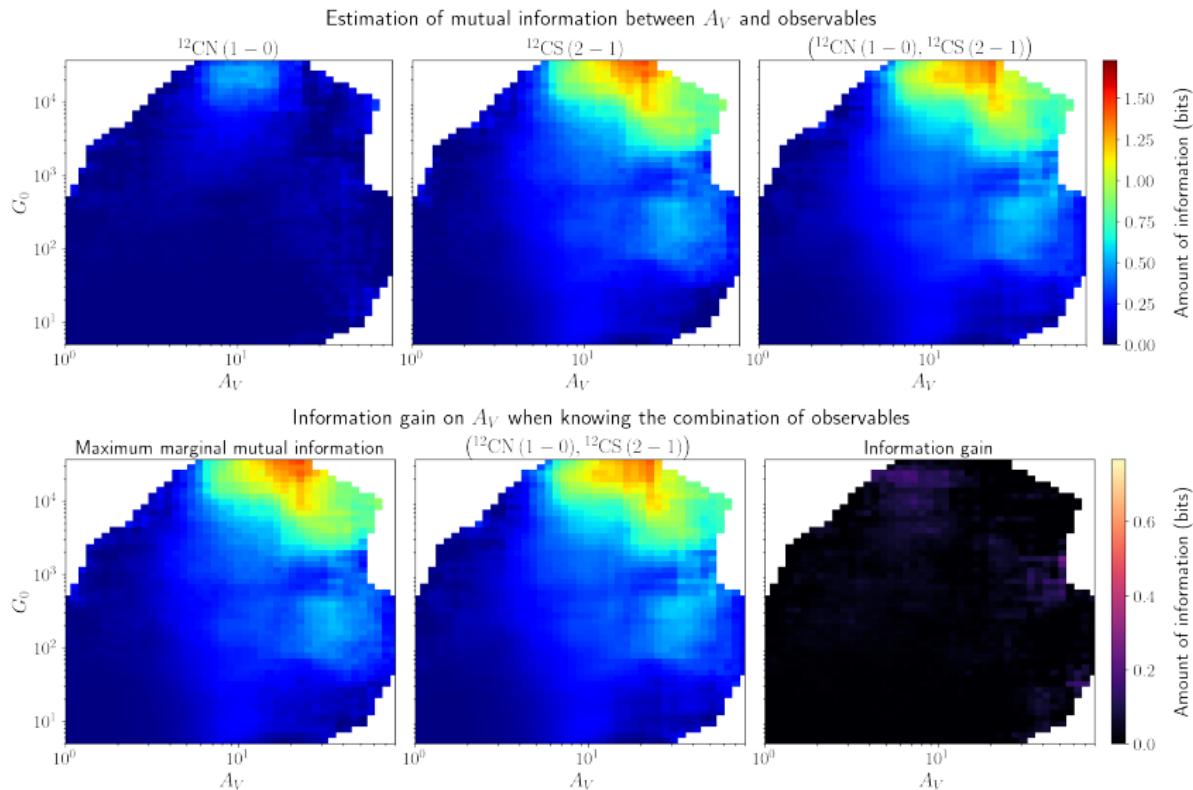
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- 12 Combinations including HNC (1 – 0) (11 available)

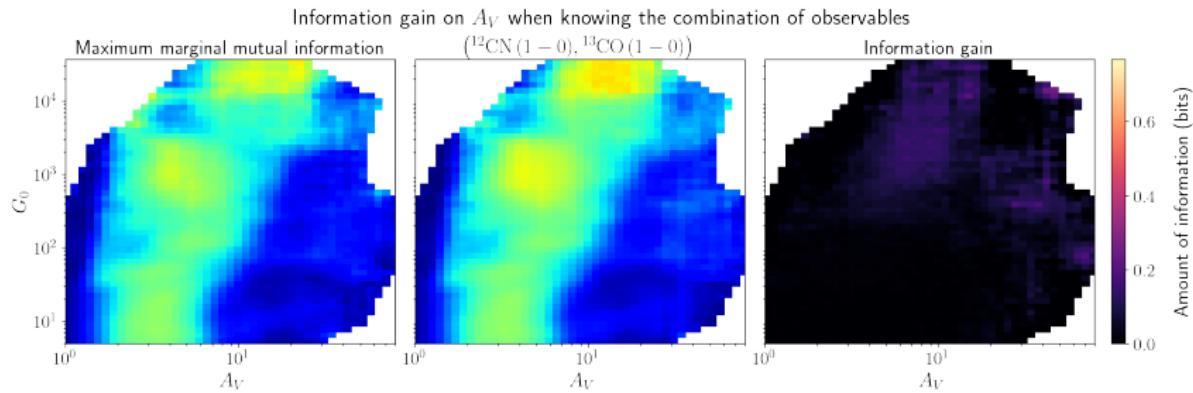
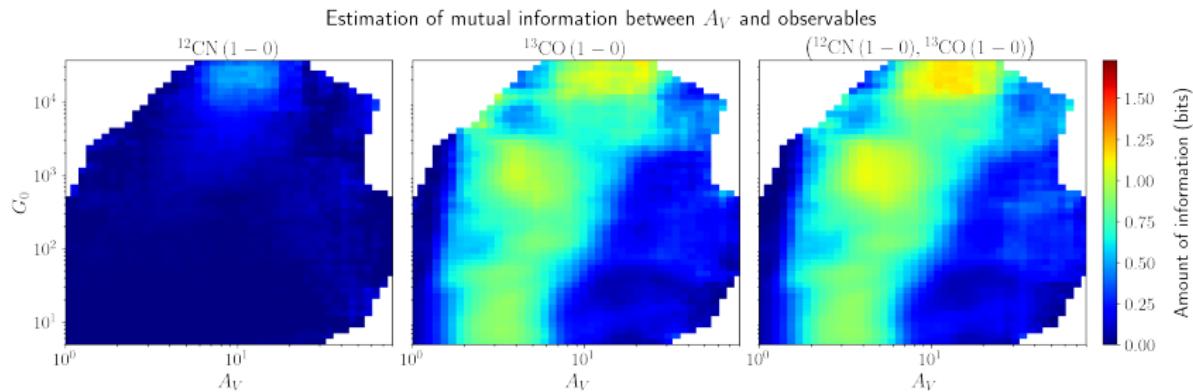
Informativity on A_V of $(^{12}\text{CN} (1 - 0), ^{12}\text{CO} (1 - 0))$



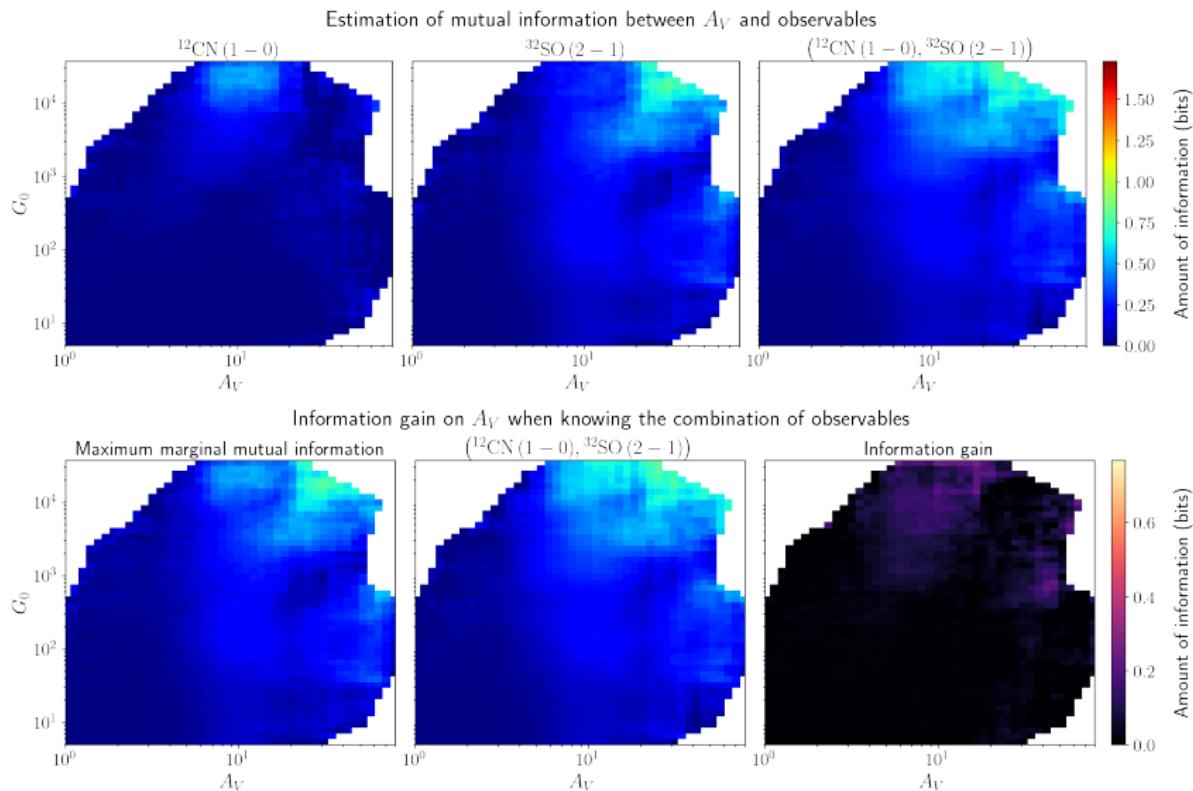
Informativity on A_V of $(^{12}\text{CN}\,(1-0), ^{12}\text{CS}\,(2-1))$



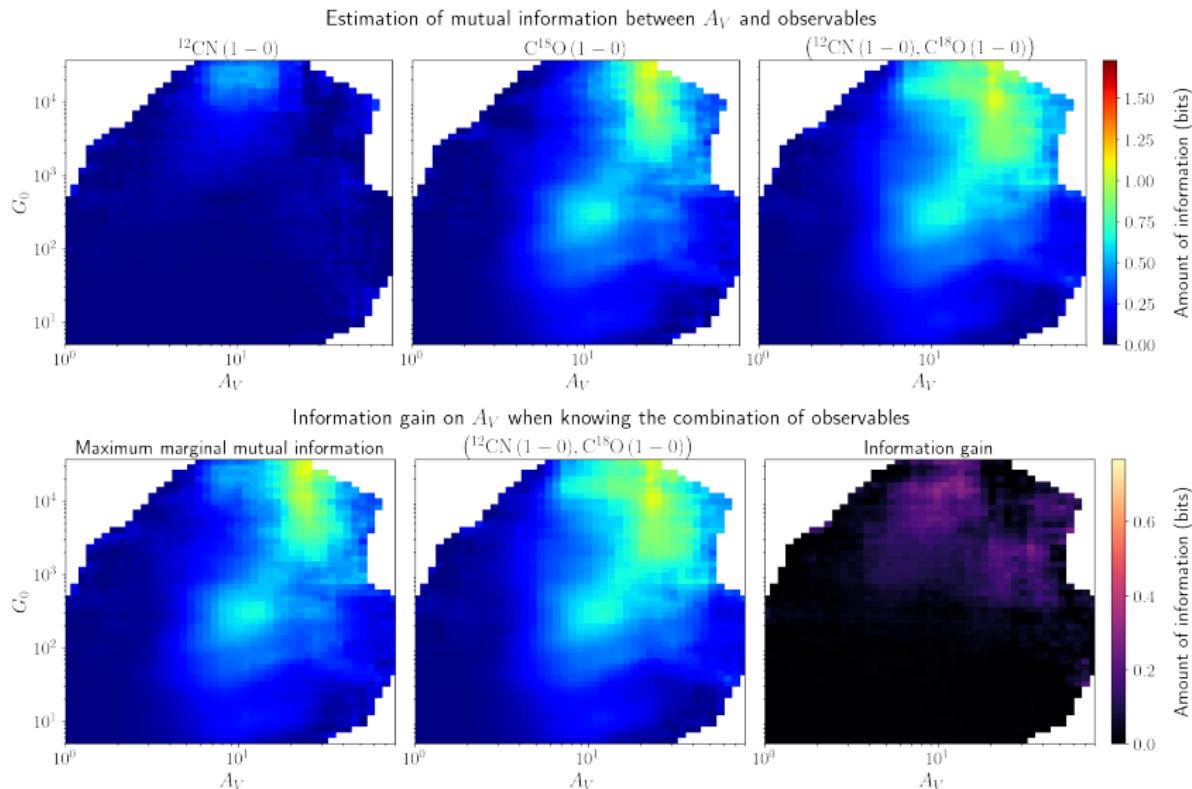
Informativity on A_V of $(^{12}\text{CN} (1 - 0), ^{13}\text{CO} (1 - 0))$



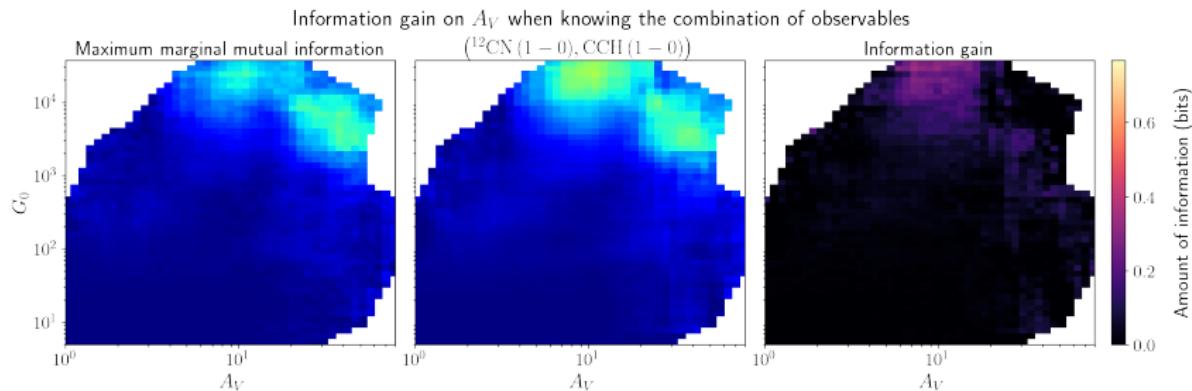
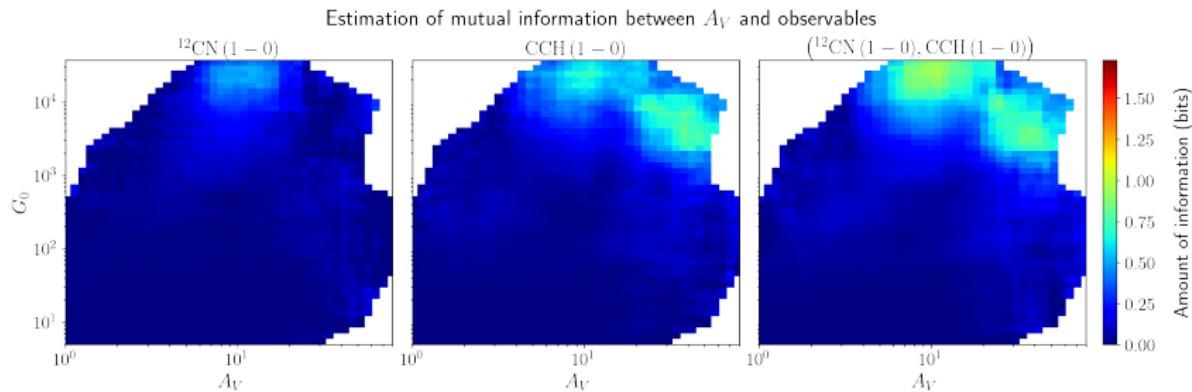
Informativity on A_V of $(^{12}\text{CN} (1 - 0), ^{32}\text{SO} (2 - 1))$



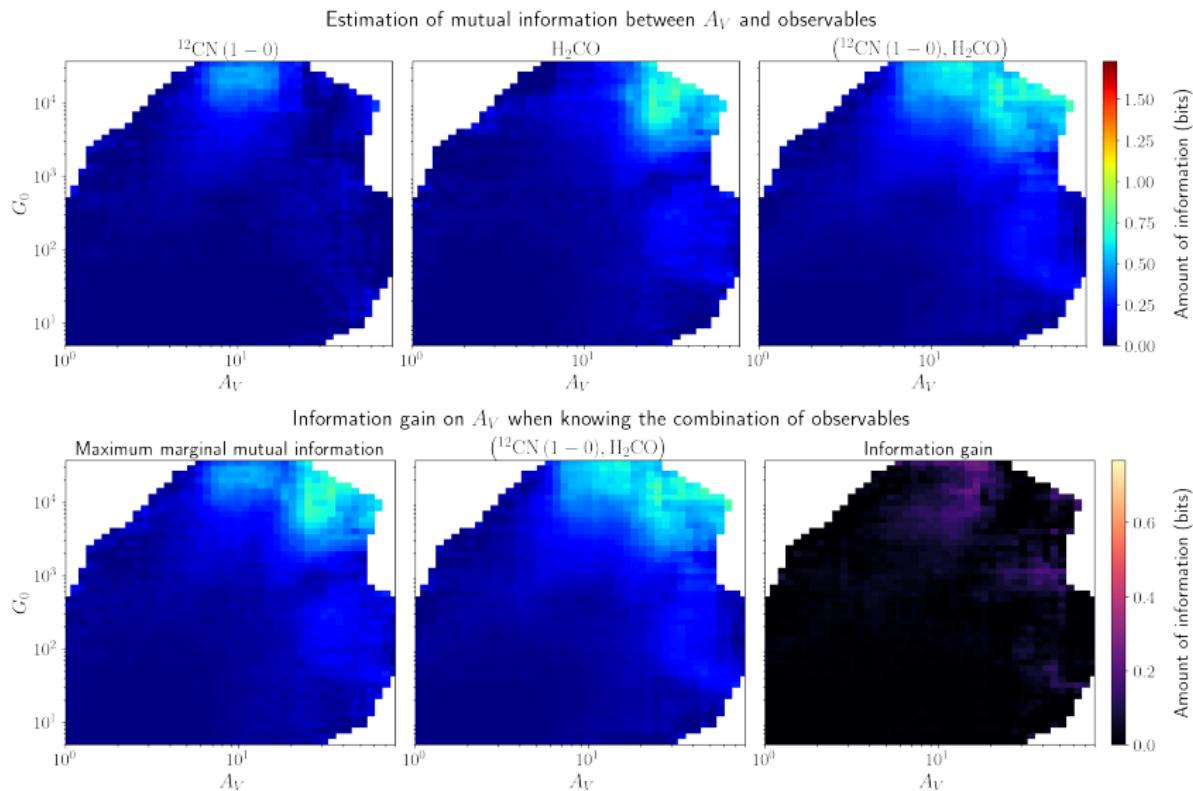
Informativity on A_V of $(^{12}\text{CN} (1 - 0), \text{C}^{18}\text{O} (1 - 0))$



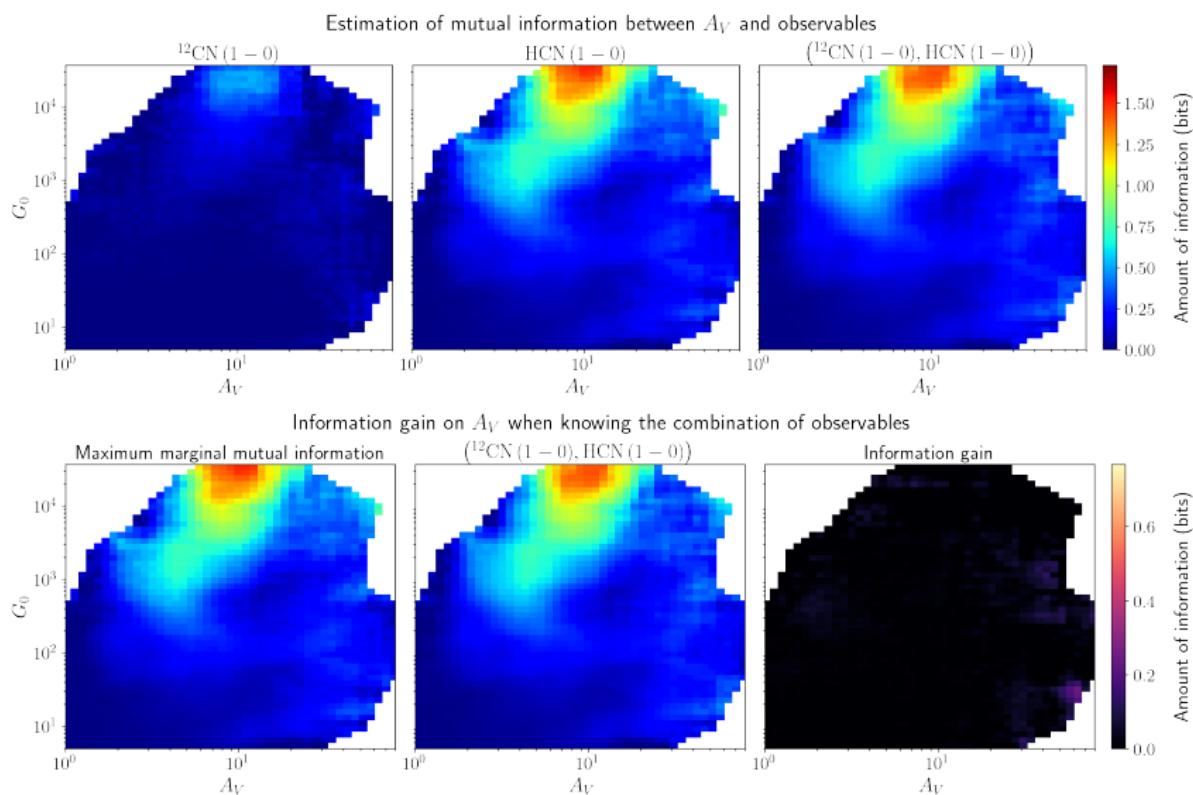
Informativity on A_V of $(^{12}\text{CN}(1 - 0), \text{CCH}(1 - 0))$



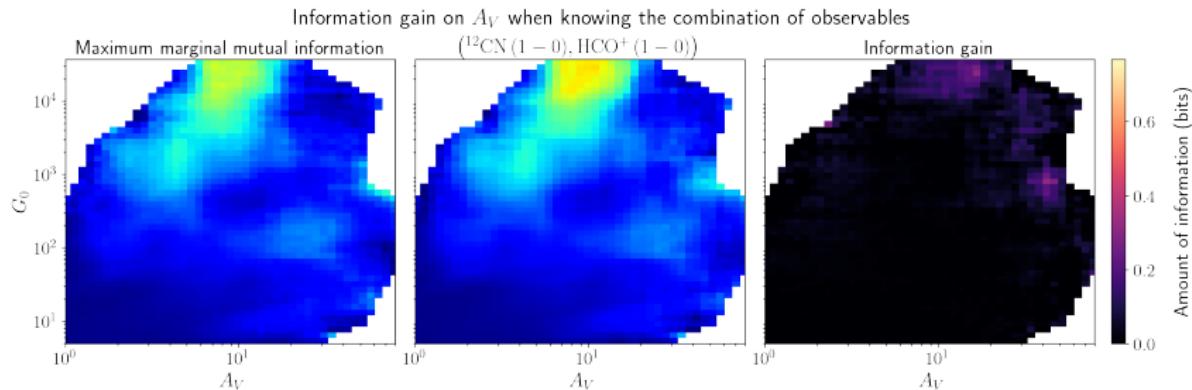
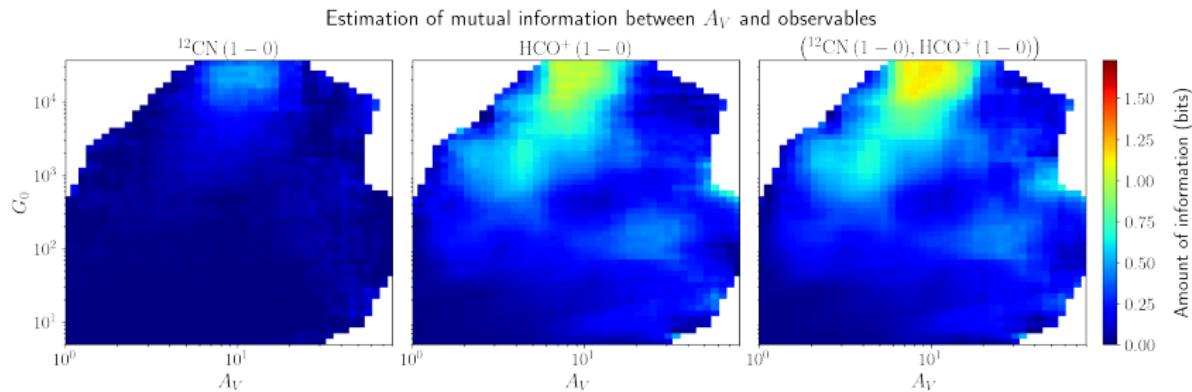
Informativity on A_V of $(^{12}\text{CN} (1 - 0), \text{H}_2\text{CO})$



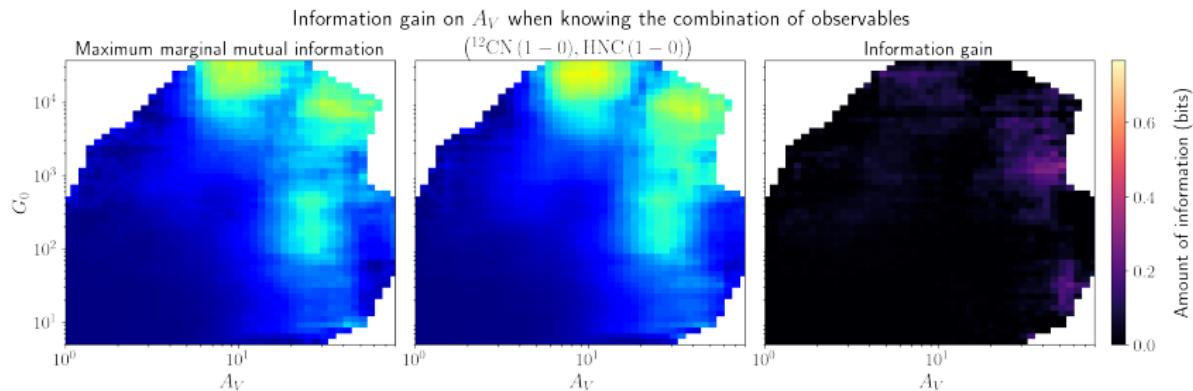
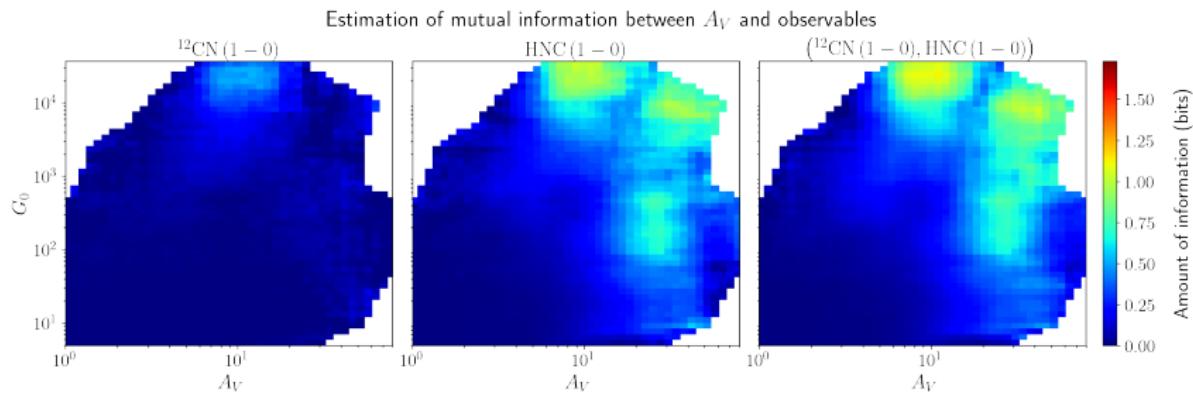
Informativity on A_V of $(^{12}\text{CN}(1 - 0), \text{HCN}(1 - 0))$



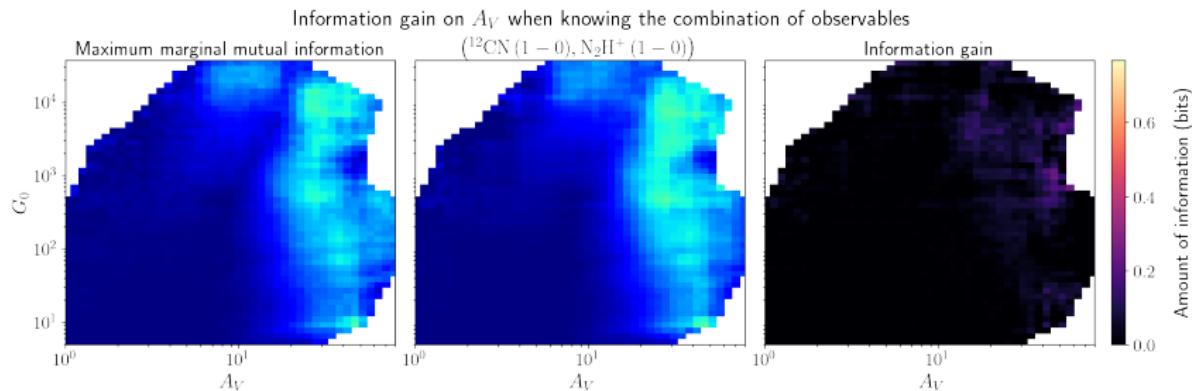
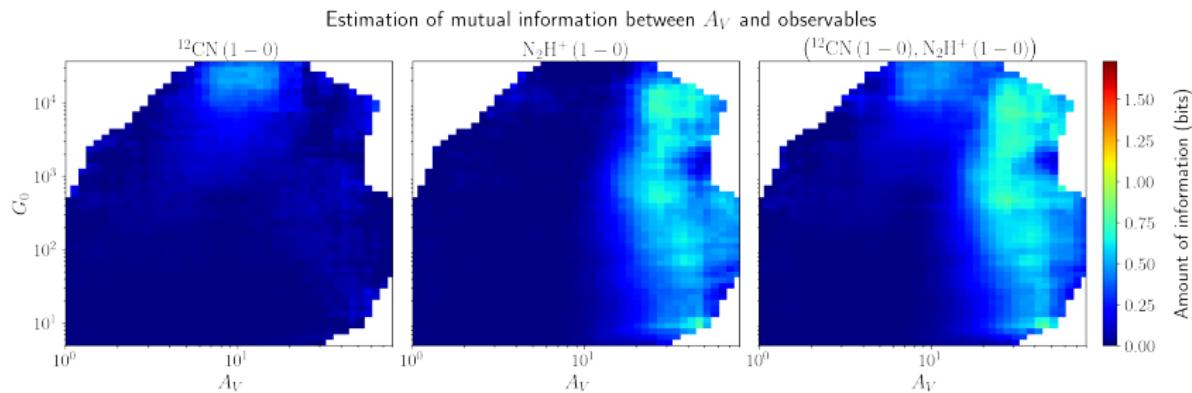
Informativity on A_V of $(^{12}\text{CN} (1 - 0), \text{HCO}^+ (1 - 0))$



Informativity on A_V of $(^{12}\text{CN}(1 - 0), \text{HNC}(1 - 0))$



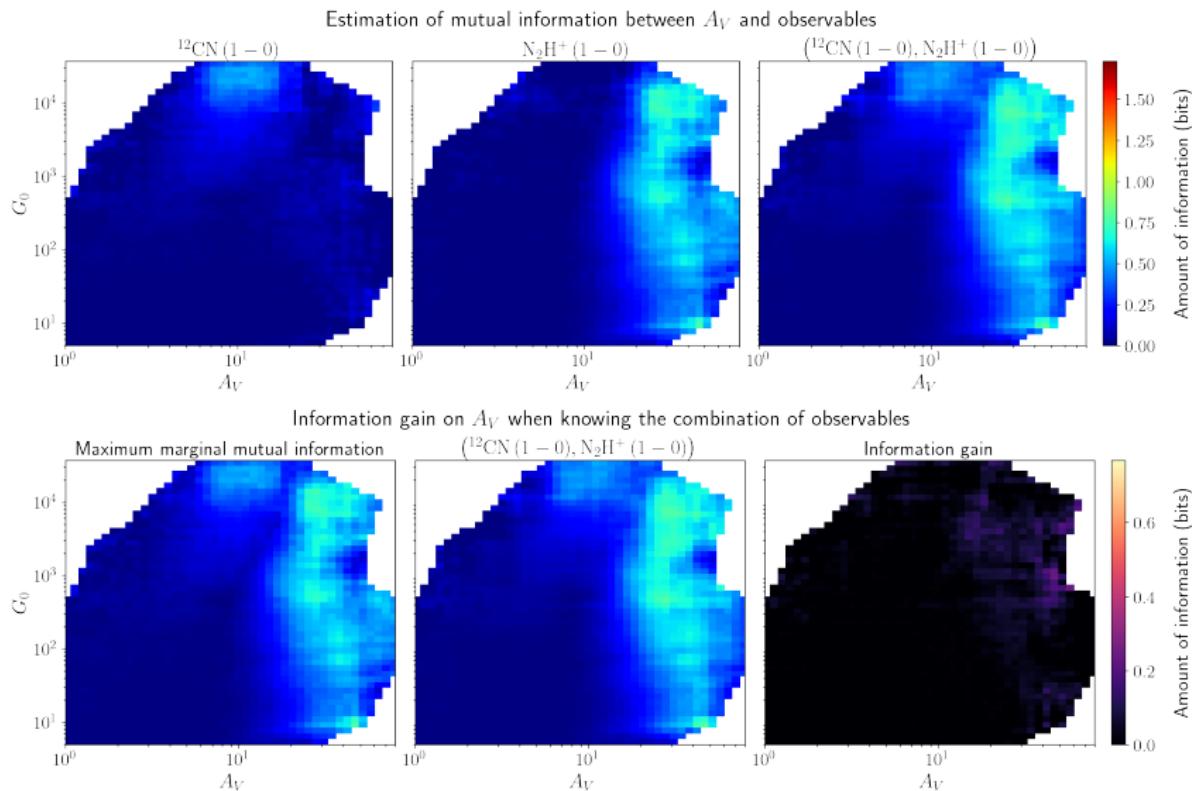
Informativity on A_V of $(^{12}\text{CN} (1 - 0), \text{N}_2\text{H}^+ (1 - 0))$



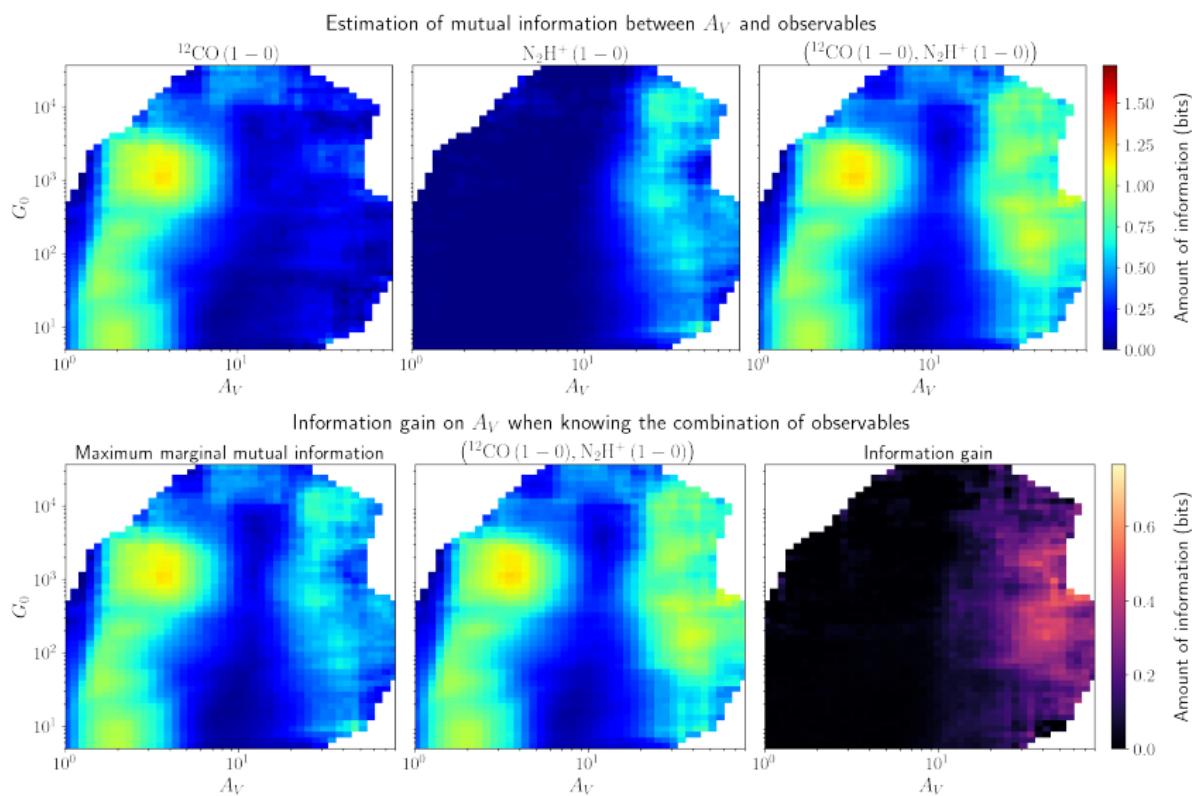
Outline

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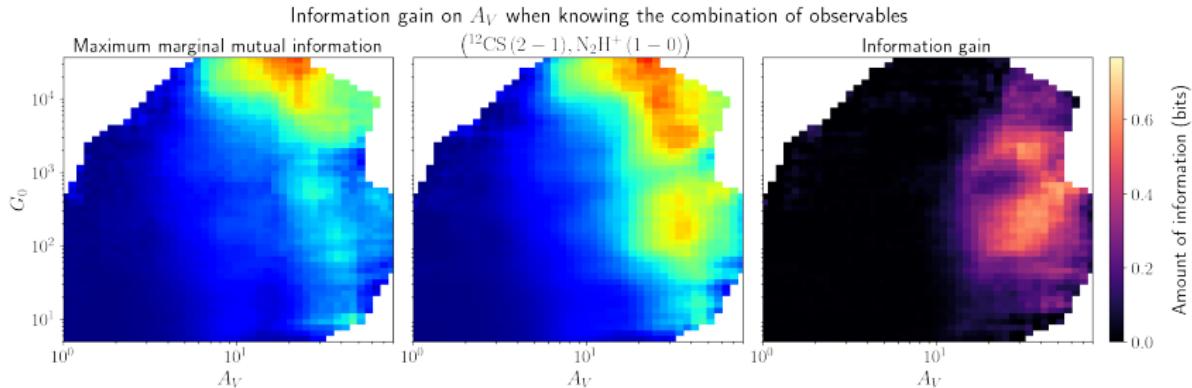
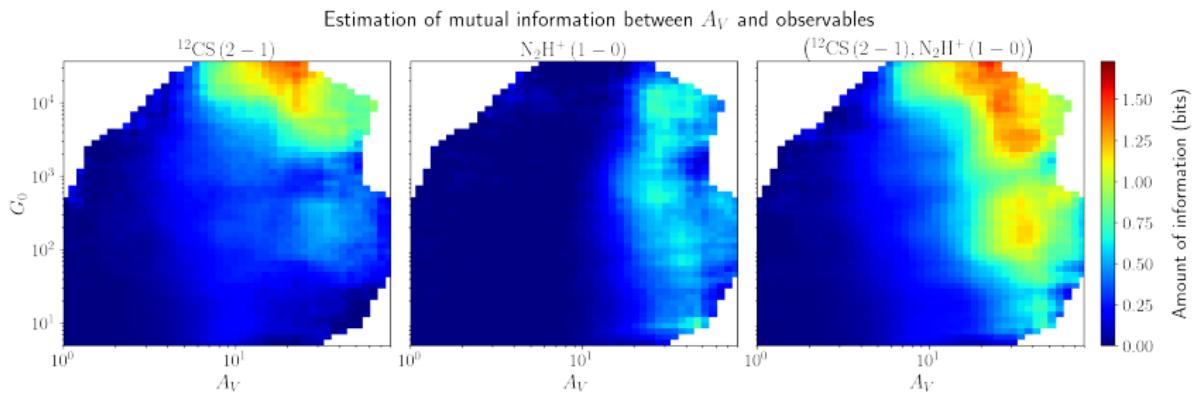
Informativity on A_V of $(^{12}\text{CN} (1 - 0), \text{N}_2\text{H}^+ (1 - 0))$



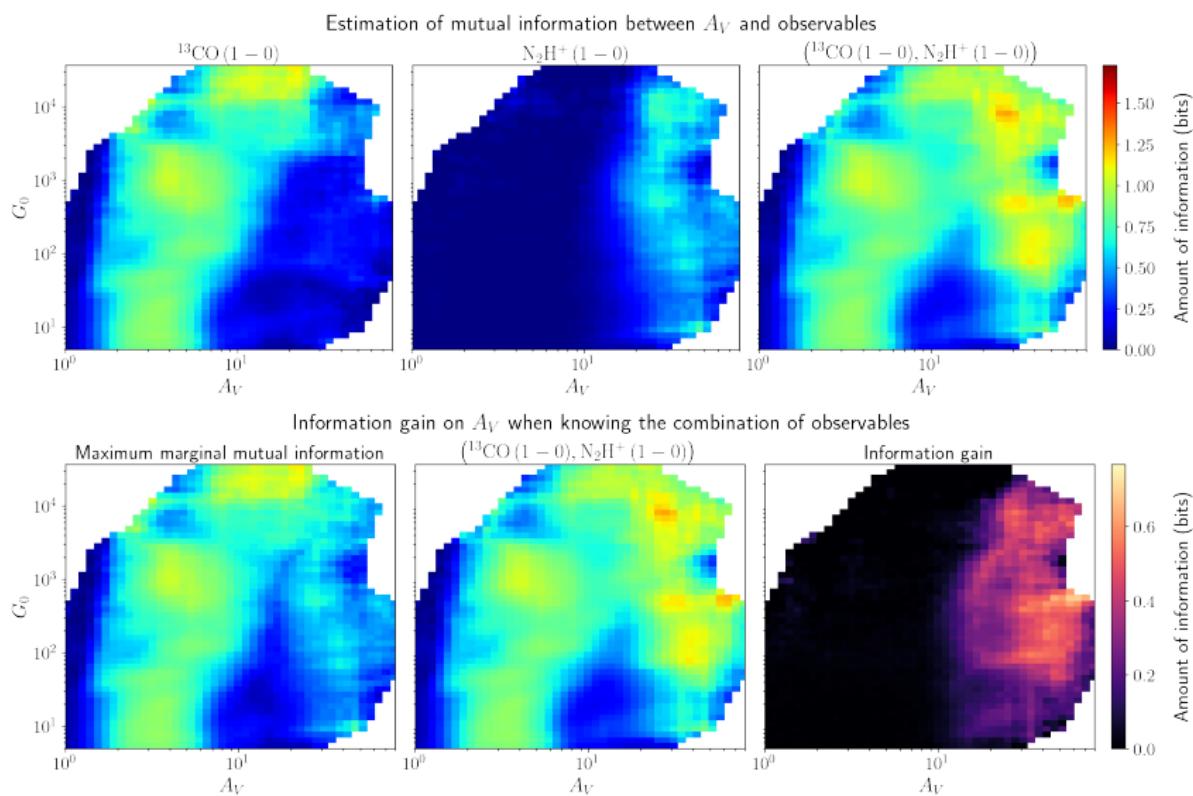
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{N}_2\text{H}^+ (1 - 0))$



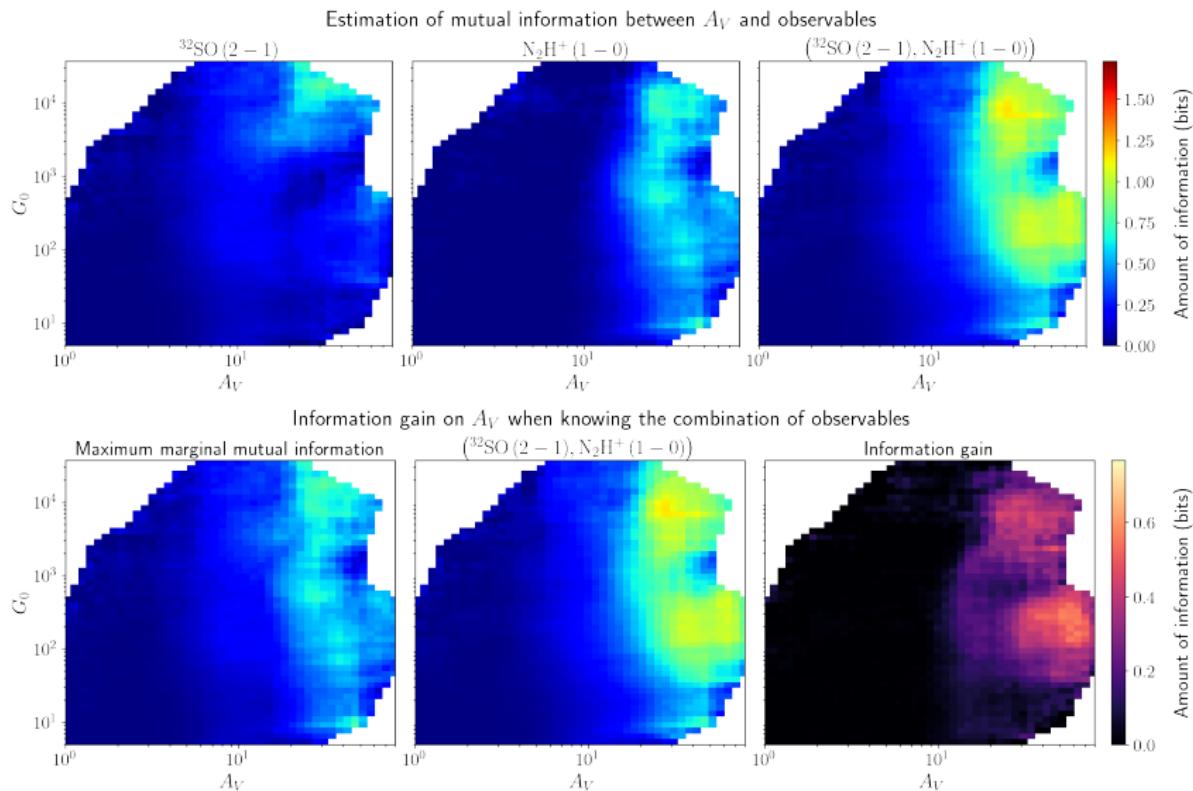
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{N}_2\text{H}^+ (1 - 0))$



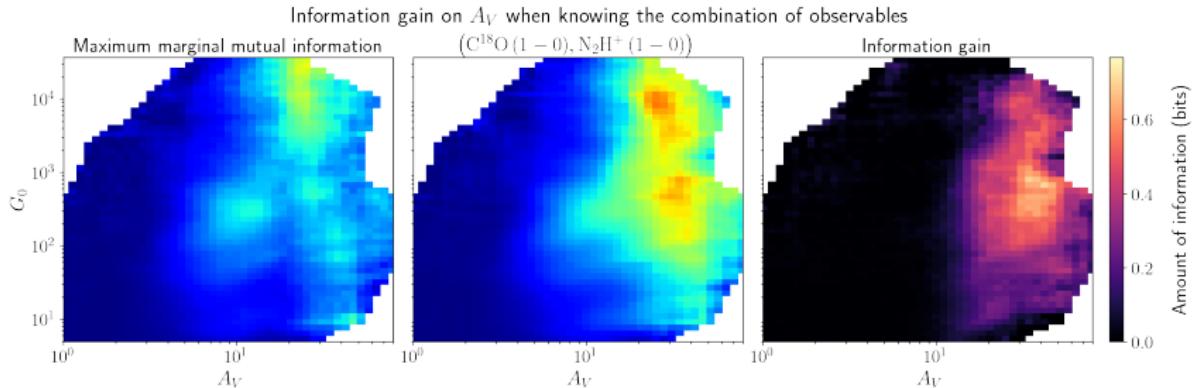
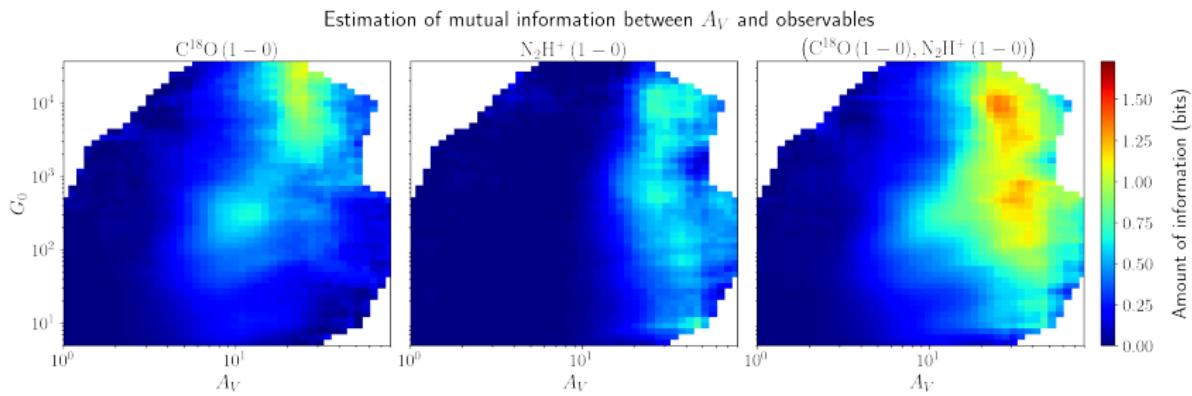
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{N}_2\text{H}^+ (1 - 0))$



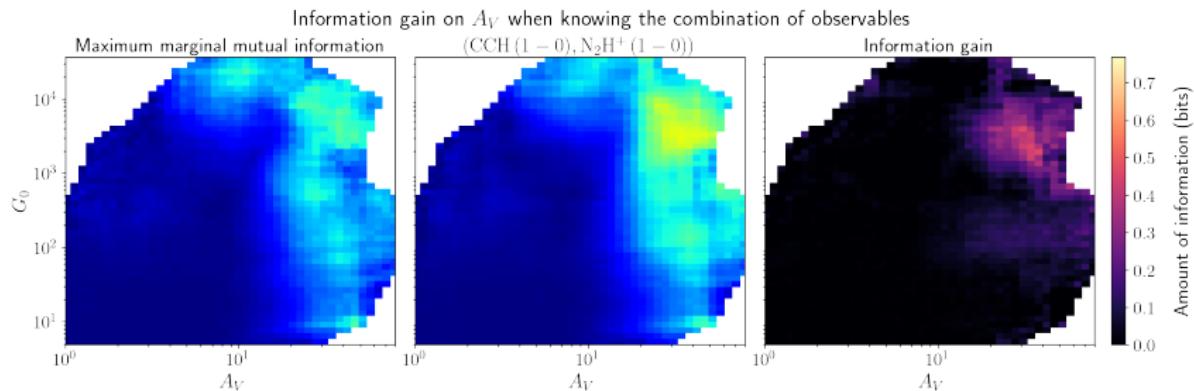
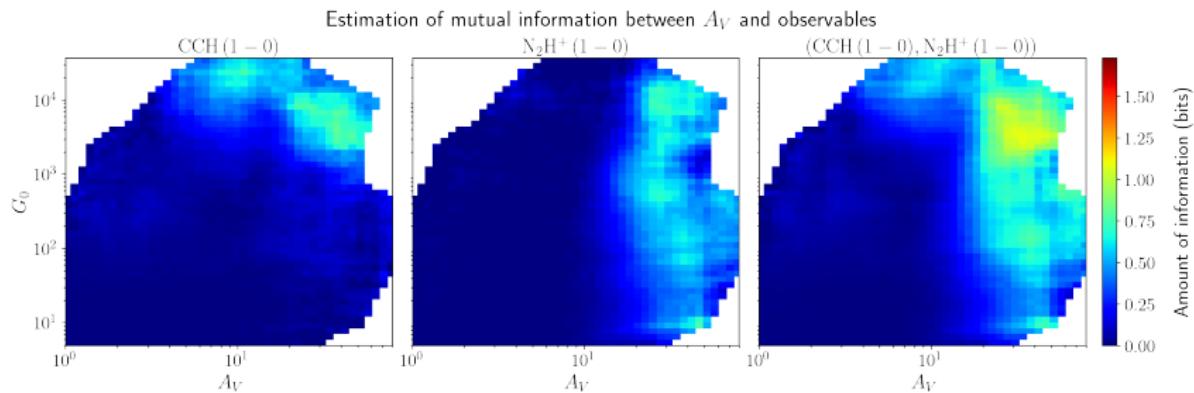
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{N}_2\text{H}^+ (1 - 0))$



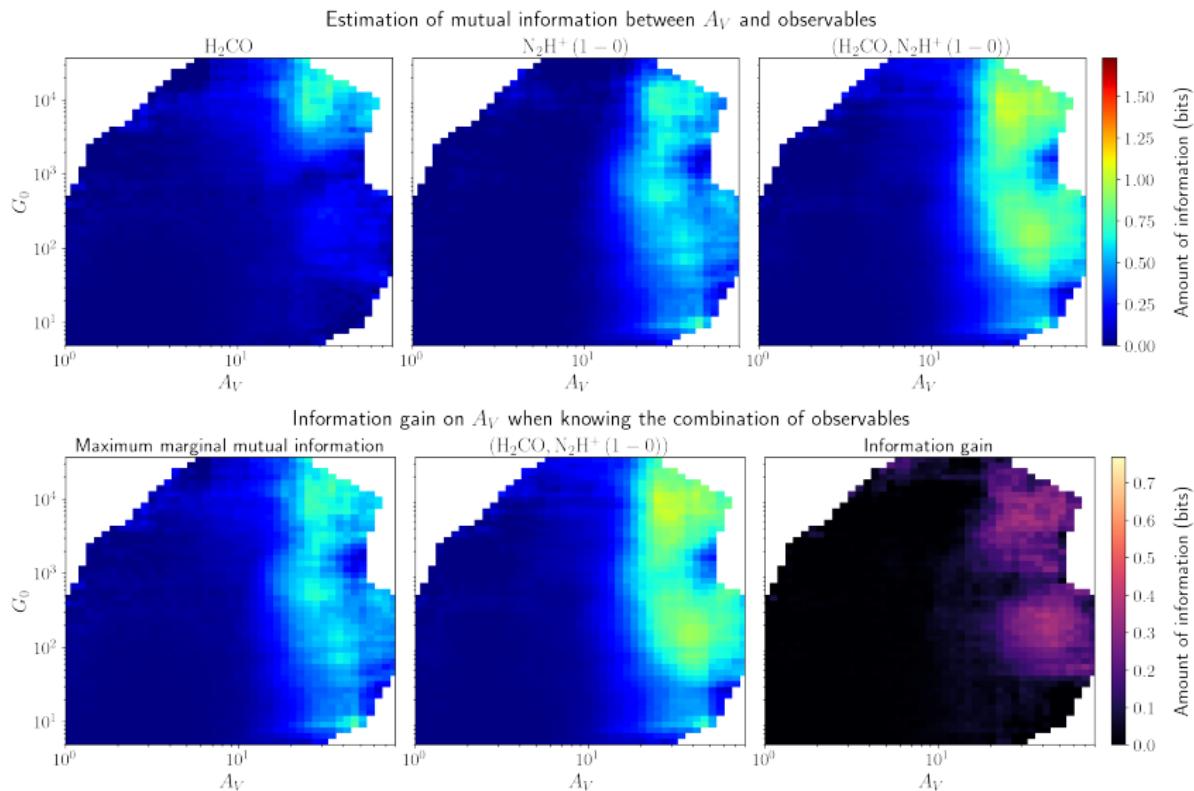
Informativity on A_V of $(C^{18}O(1-0), N_2H^+(1-0))$



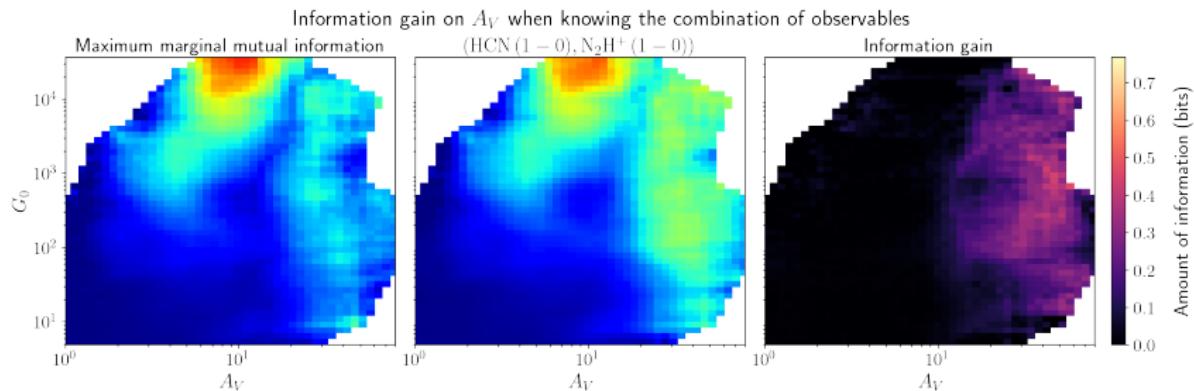
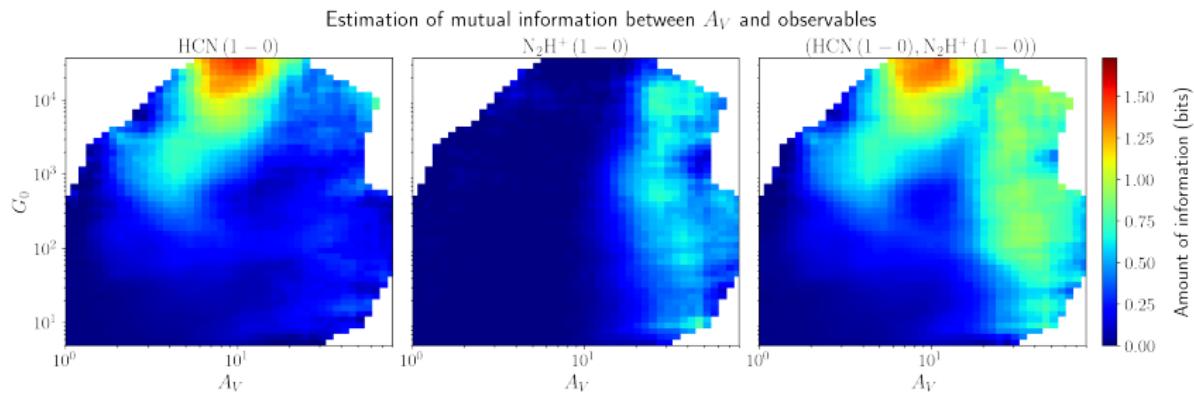
Informativity on A_V of (CCH(1 - 0), N₂H⁺(1 - 0))



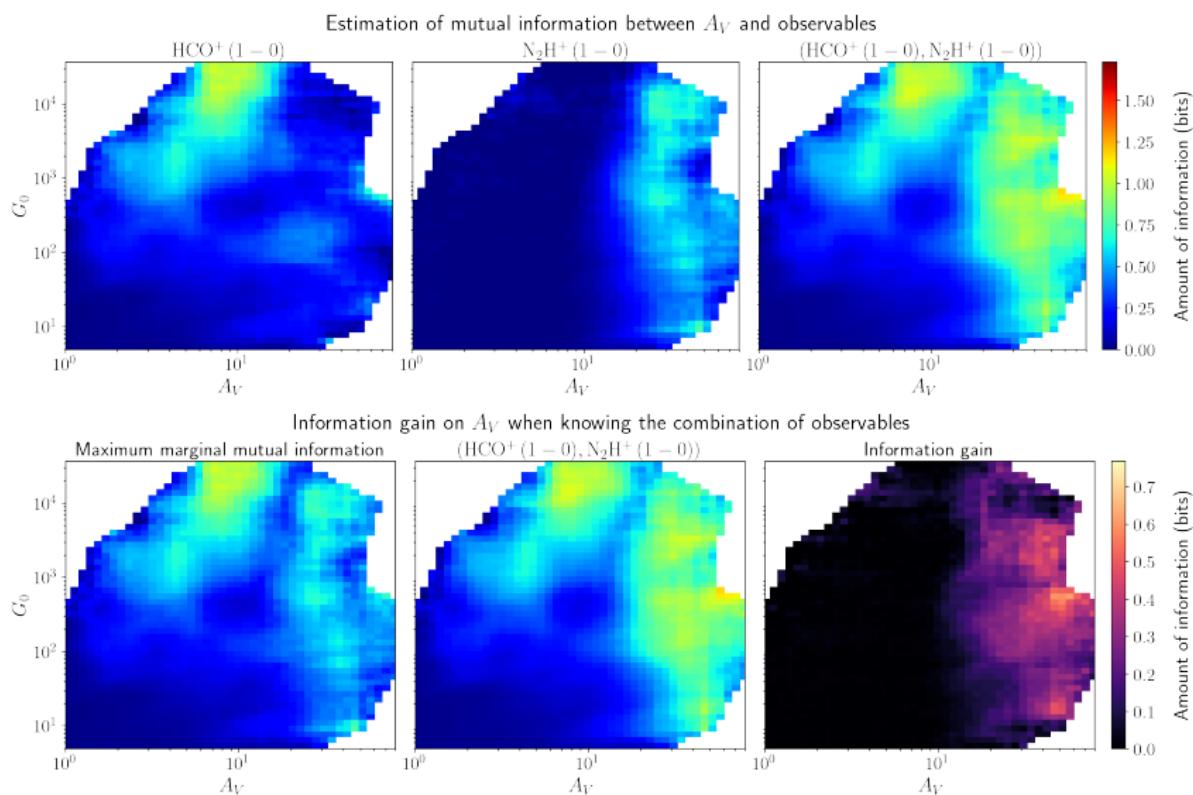
Informativity on A_V of (H_2CO , $\text{N}_2\text{H}^+ (1 - 0)$)



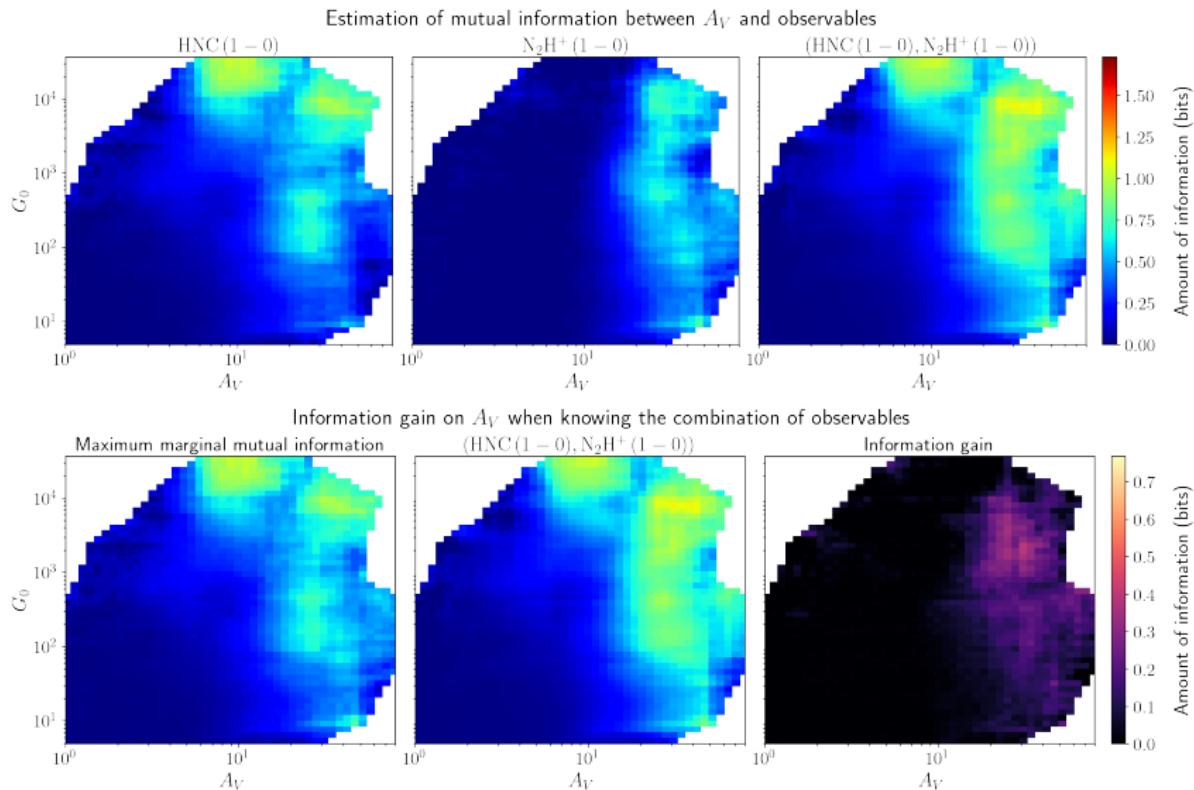
Informativity on A_V of $(\text{HCN} (1 - 0), \text{N}_2\text{H}^+ (1 - 0))$



Informativity on A_V of ($\text{HCO}^+ (1 - 0)$, $\text{N}_2\text{H}^+ (1 - 0)$)



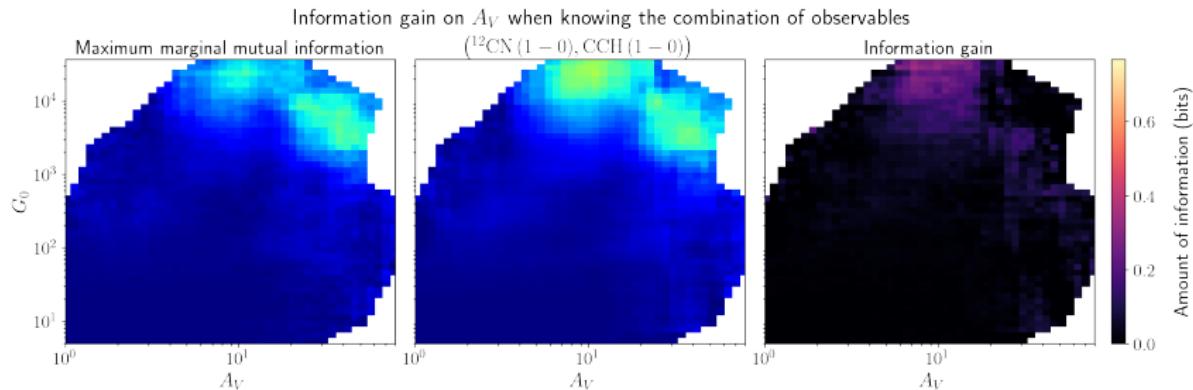
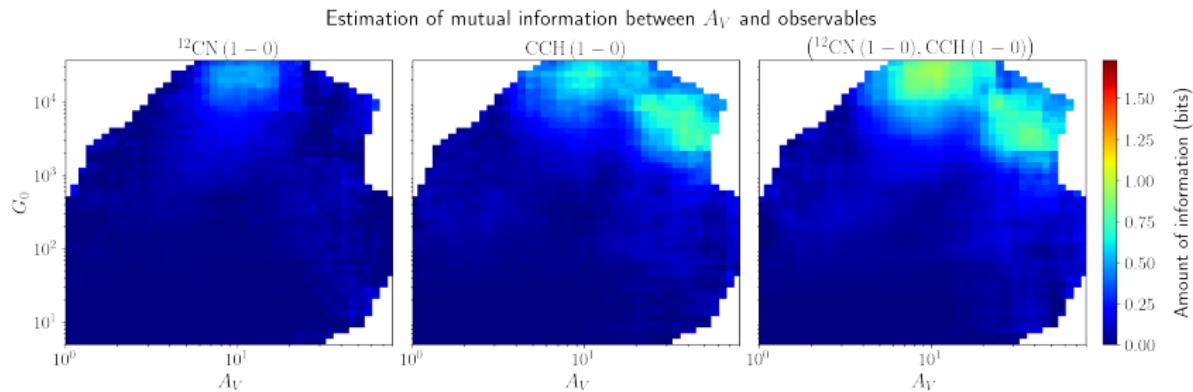
Informativity on A_V of $(\text{HNC}(1 - 0), \text{N}_2\text{H}^+(1 - 0))$



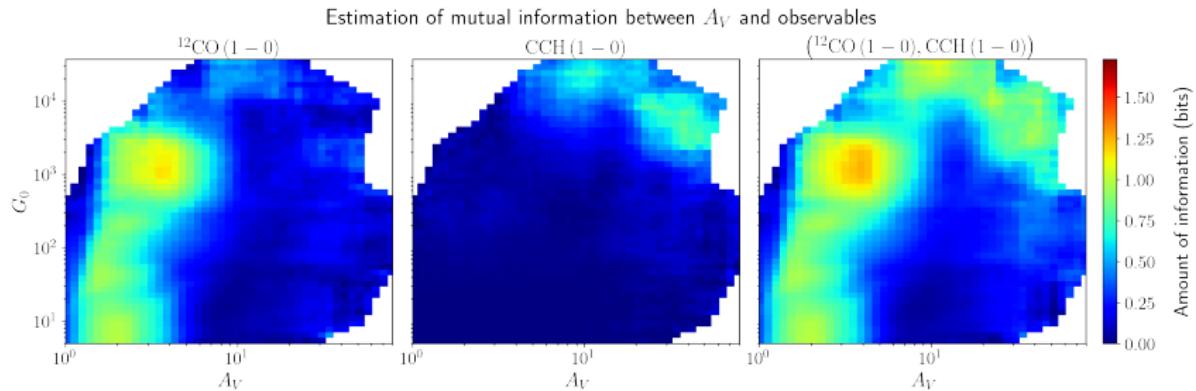
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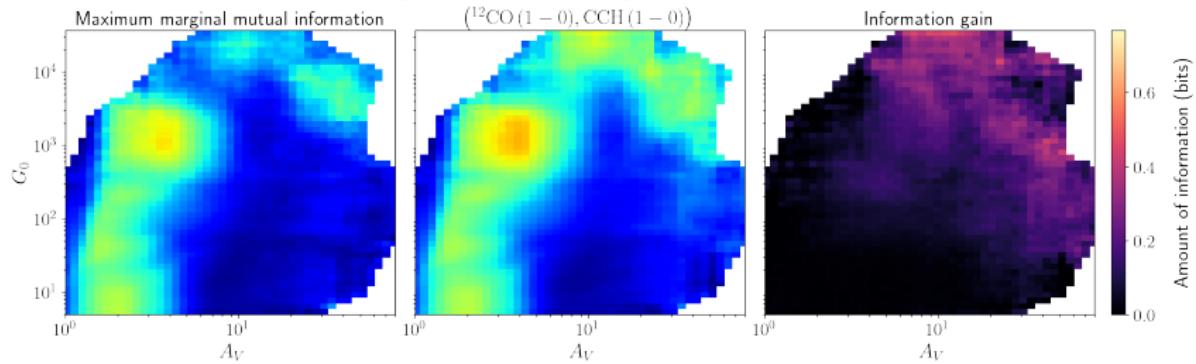
Informativity on A_V of $(^{12}\text{CN}(1 - 0), \text{CCH}(1 - 0))$



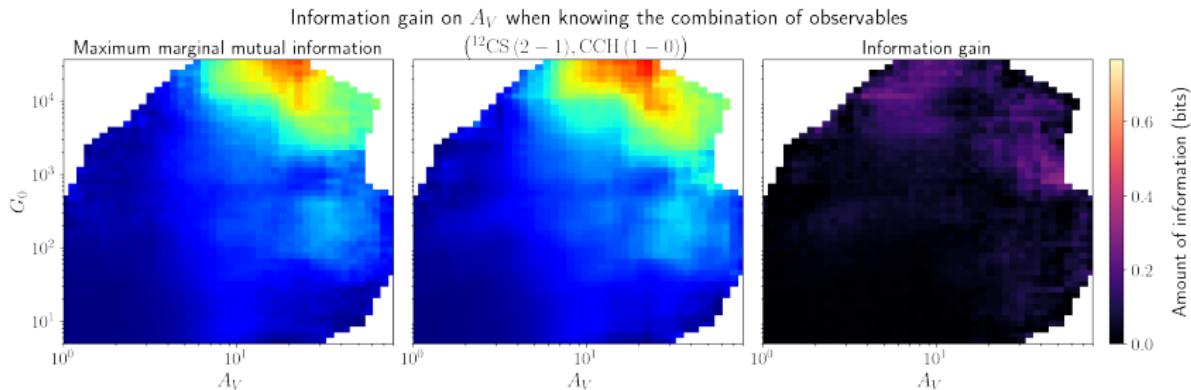
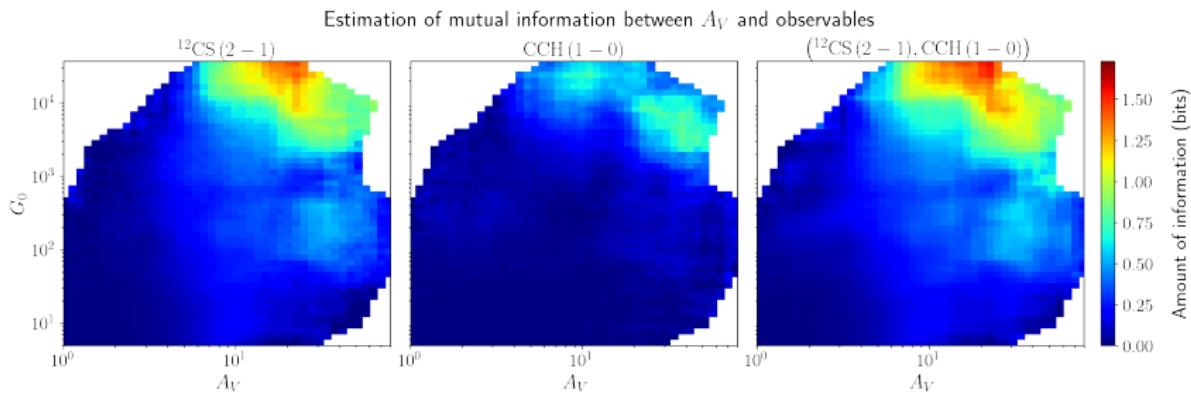
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{CCH} (1 - 0))$



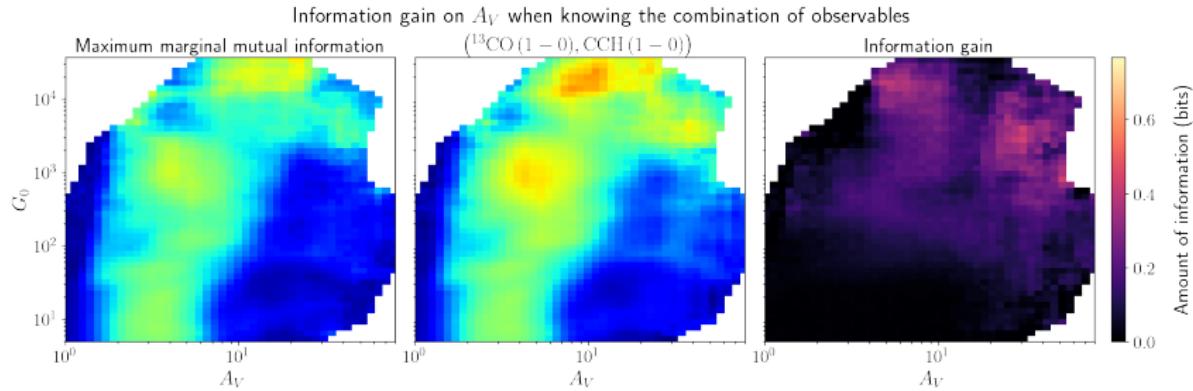
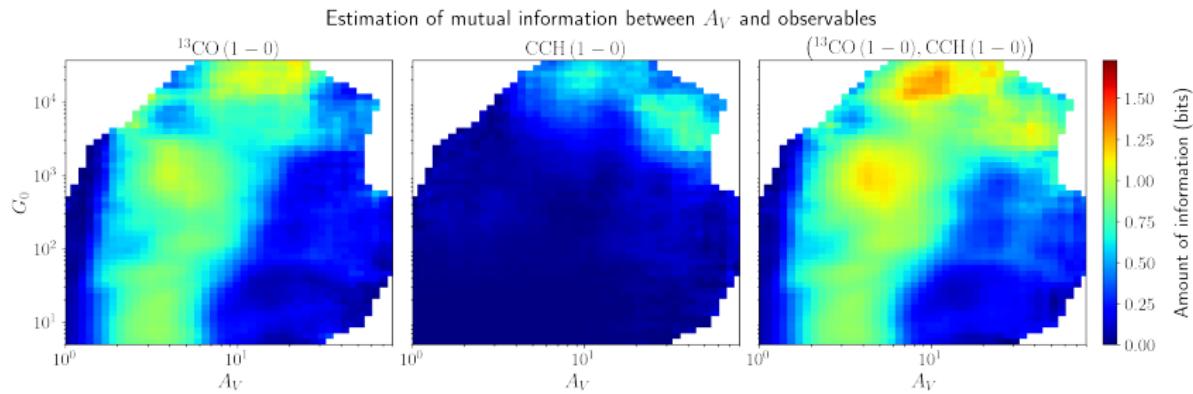
Information gain on A_V when knowing the combination of observables



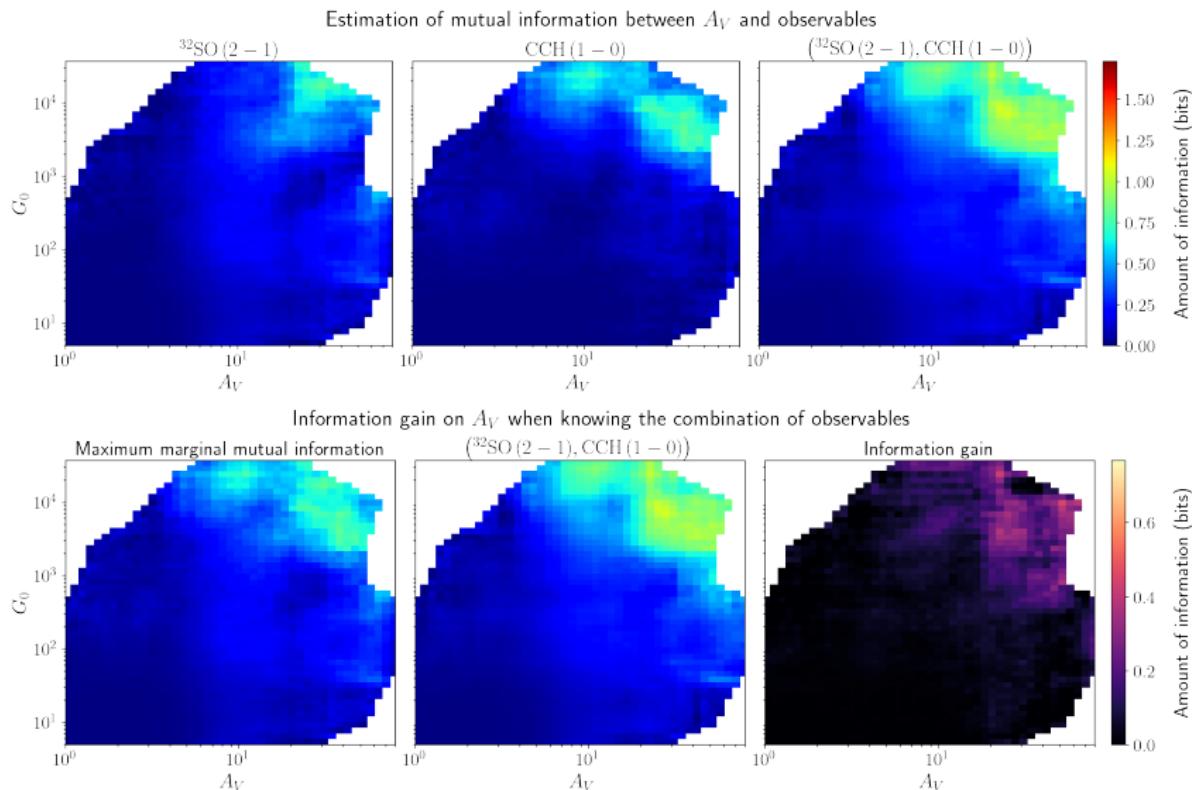
Informativity on A_V of $(^{12}\text{CS}(2 - 1), \text{CCH}(1 - 0))$



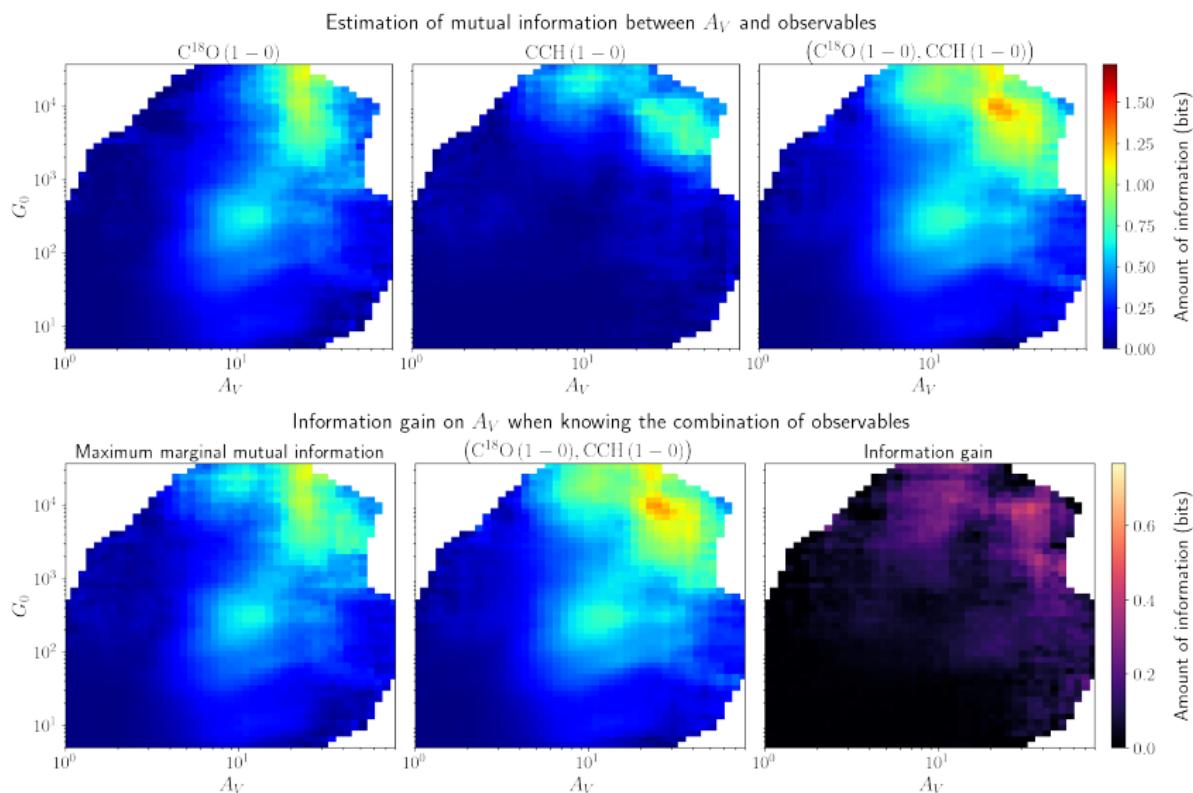
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{CCH} (1 - 0))$



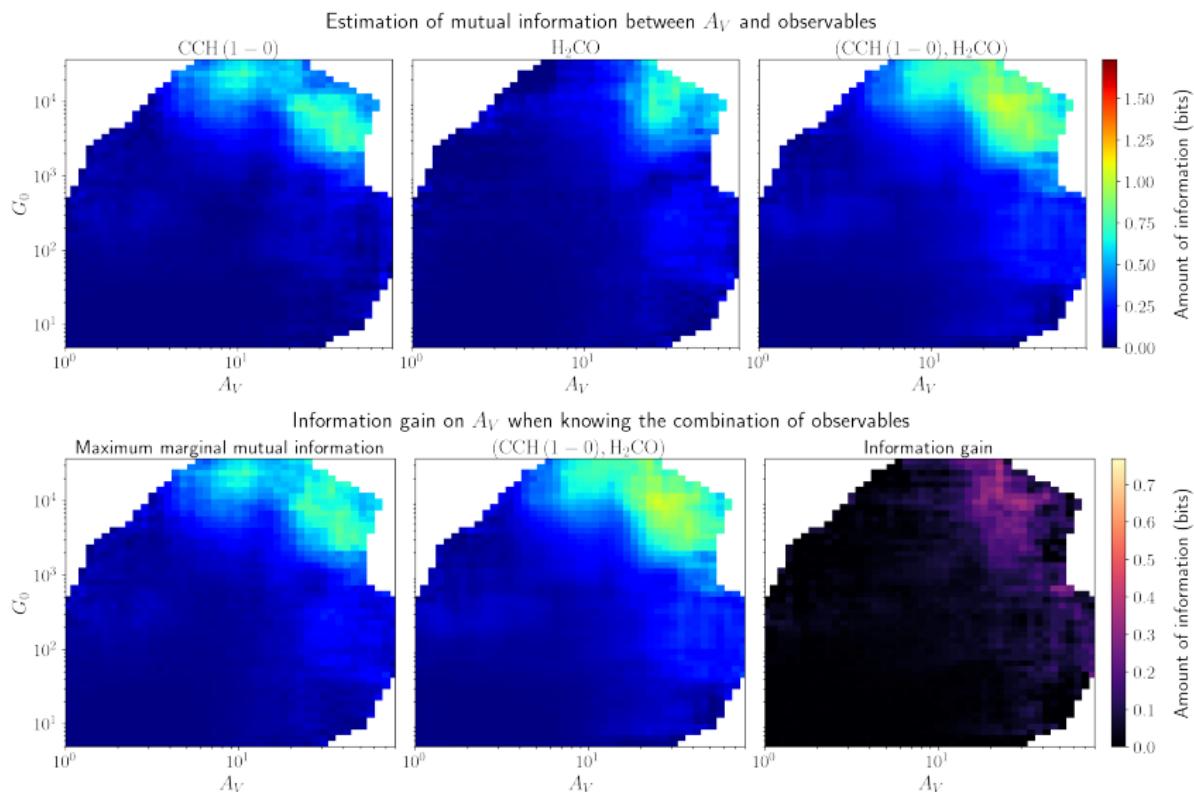
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{CCH} (1 - 0))$



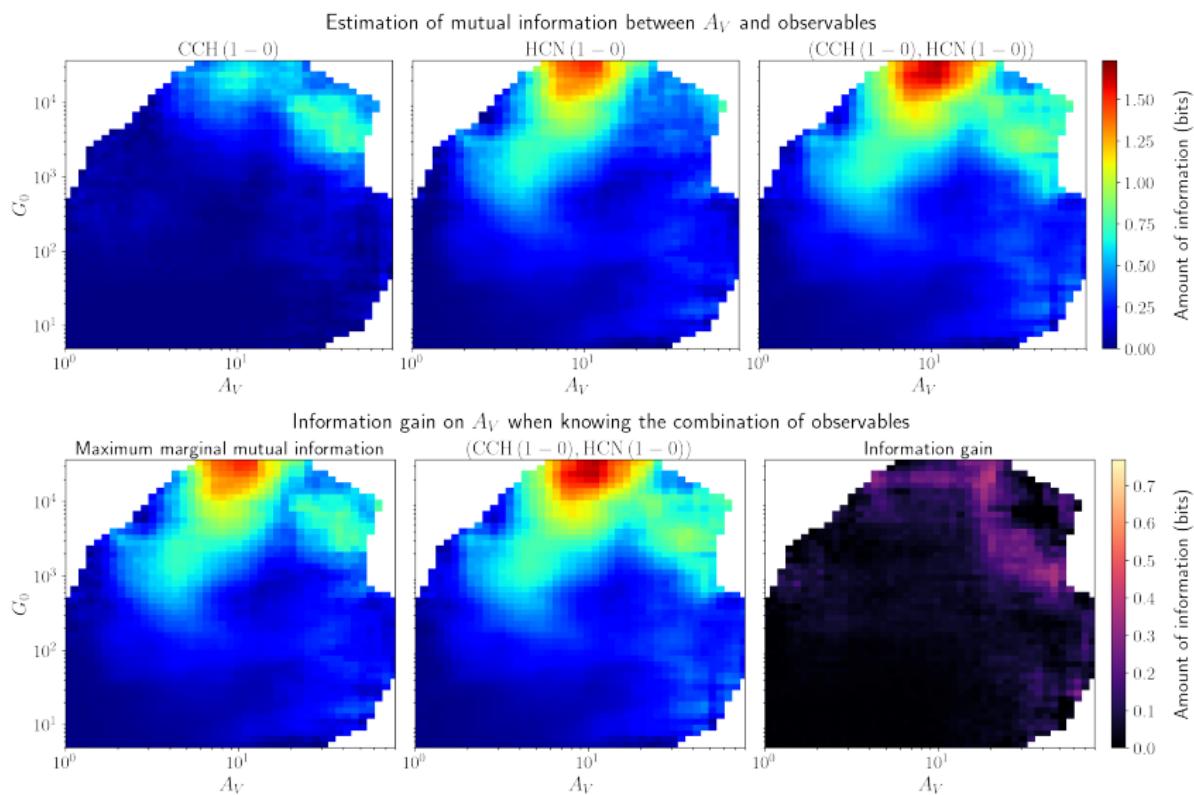
Informativity on A_V of $(C^{18}O(1 - 0), CCH(1 - 0))$



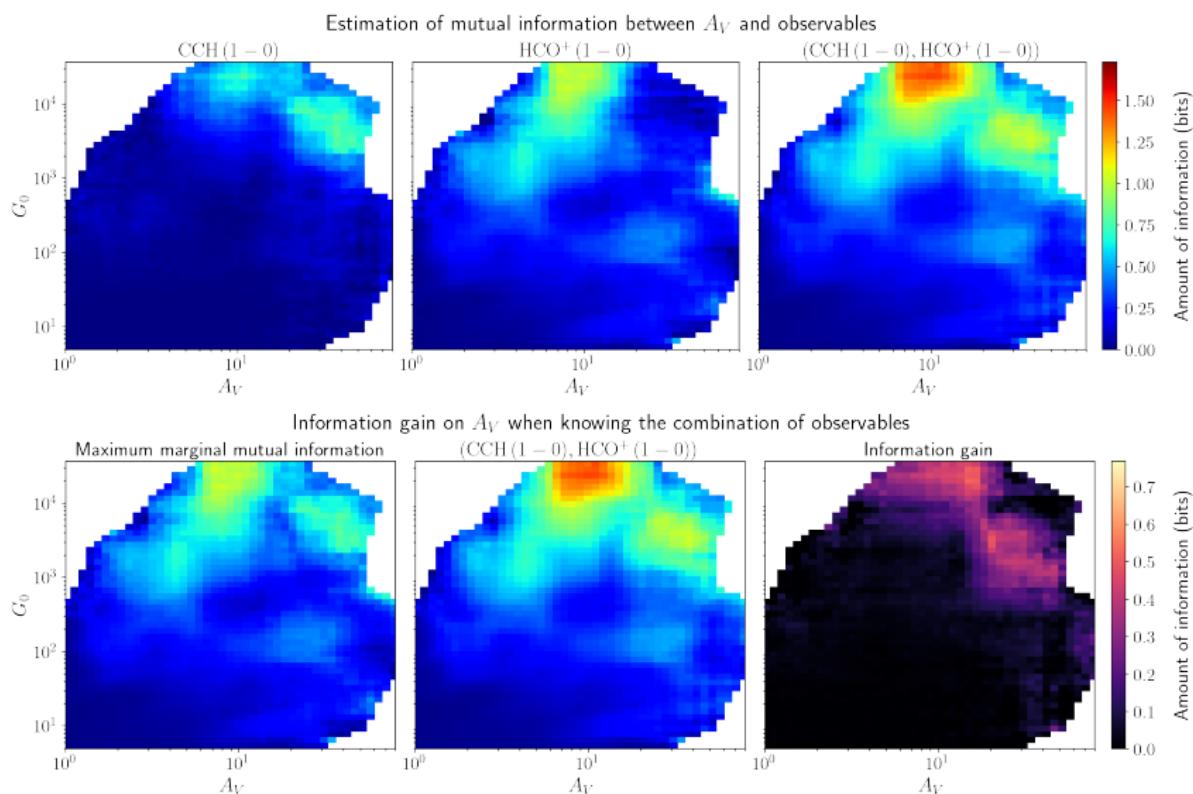
Informativity on A_V of $(\text{CCH}(1 - 0), \text{H}_2\text{CO})$



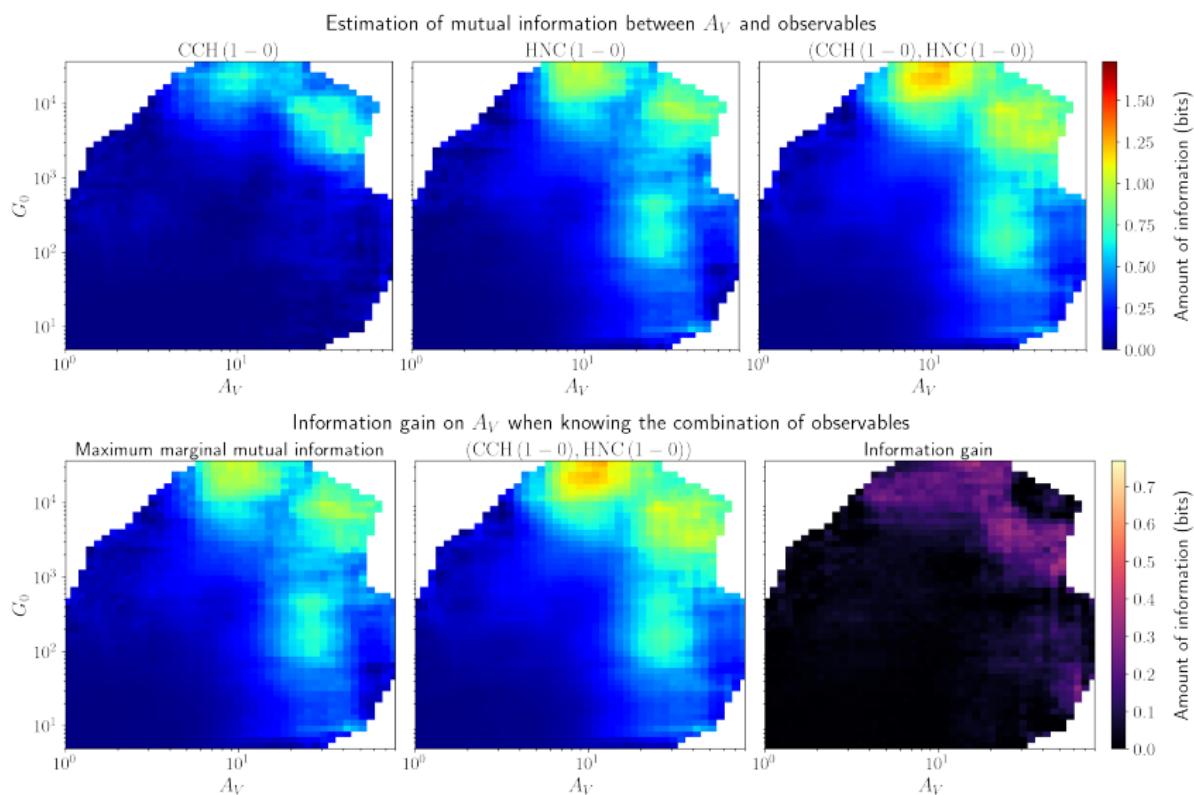
Informativity on A_V of (CCH (1 - 0), HCN (1 - 0))



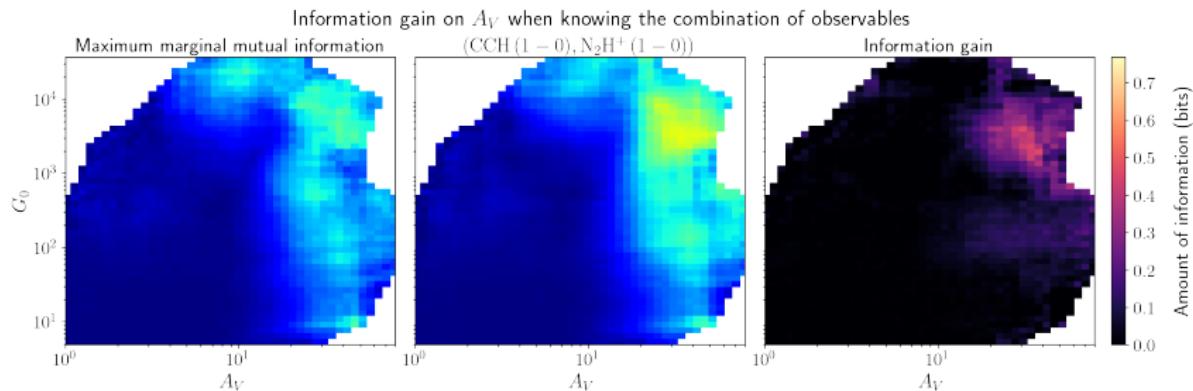
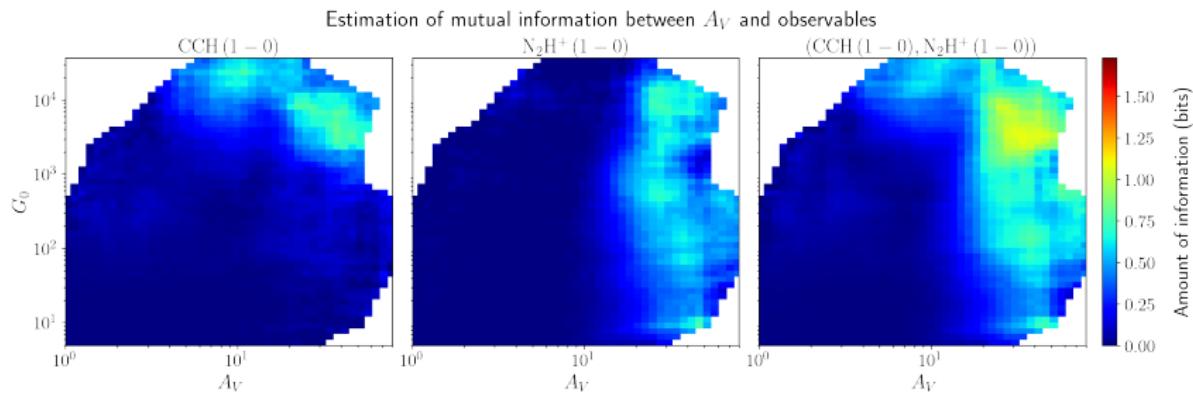
Informativity on A_V of $(\text{CCH}(1 - 0), \text{HCO}^+(1 - 0))$



Informativity on A_V of (CCH(1 - 0), HNC(1 - 0))



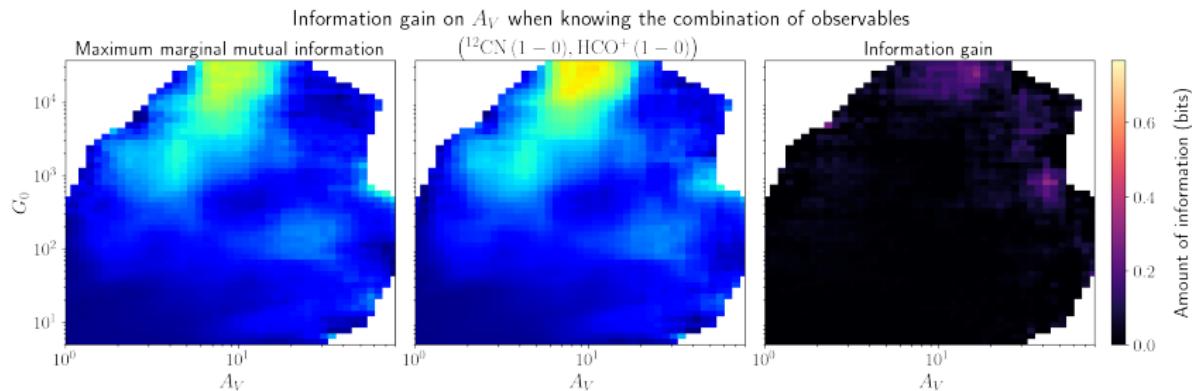
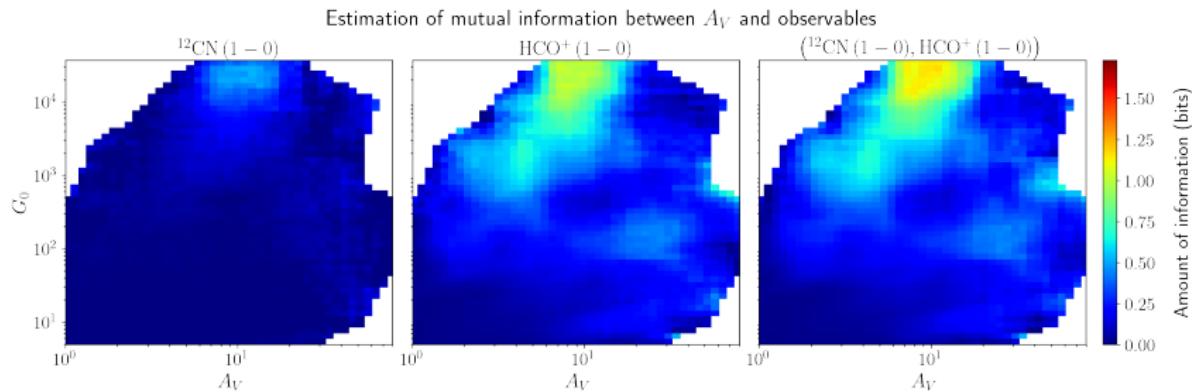
Informativity on A_V of (CCH(1 - 0), N₂H⁺(1 - 0))



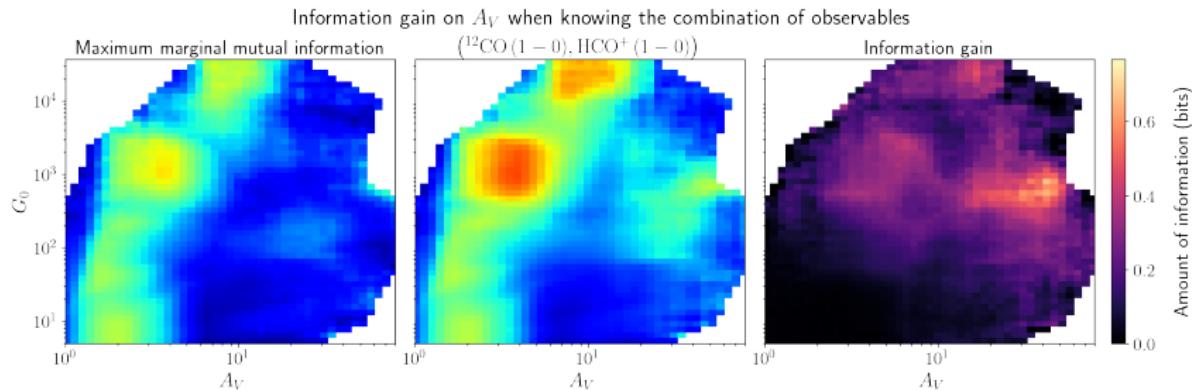
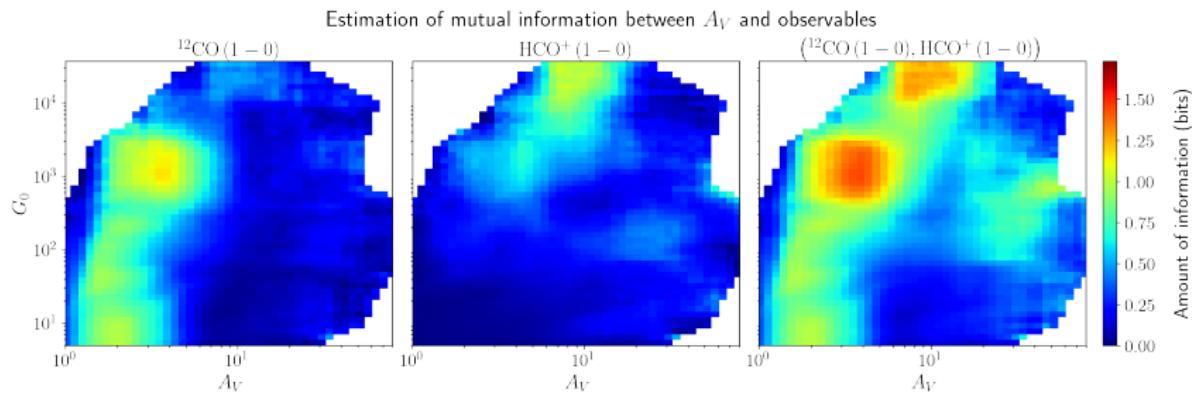
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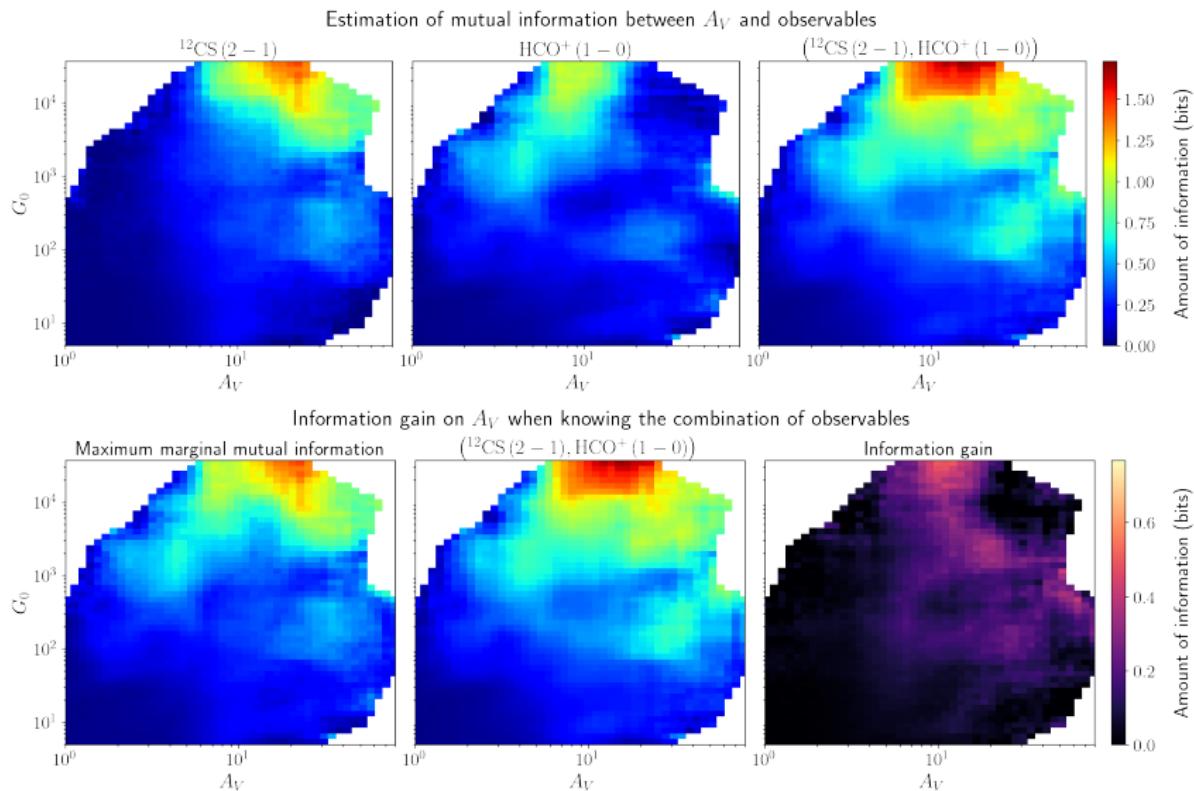
Informativity on A_V of $(^{12}\text{CN} (1 - 0), \text{HCO}^+ (1 - 0))$



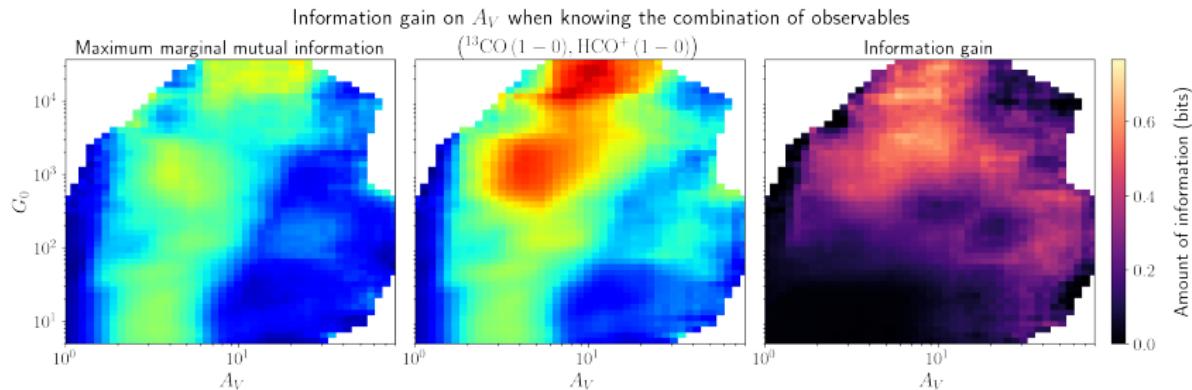
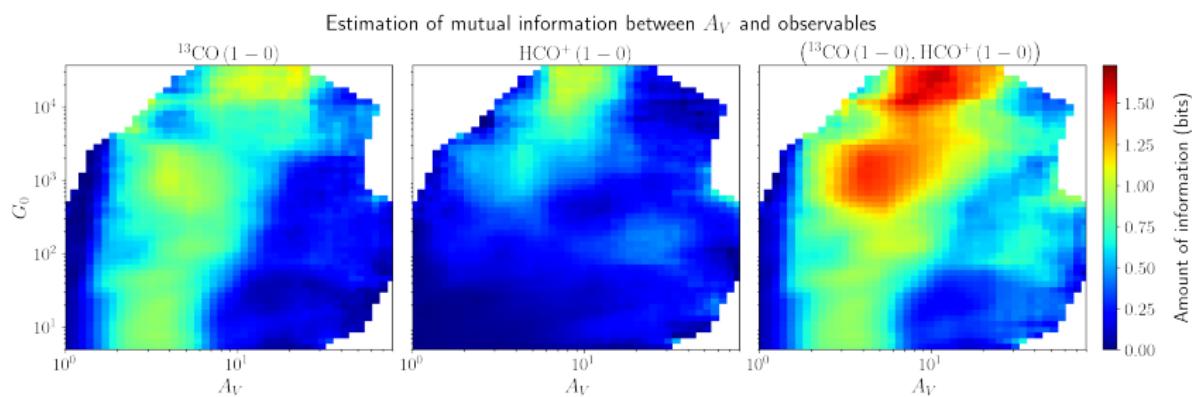
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{HCO}^+ (1 - 0))$



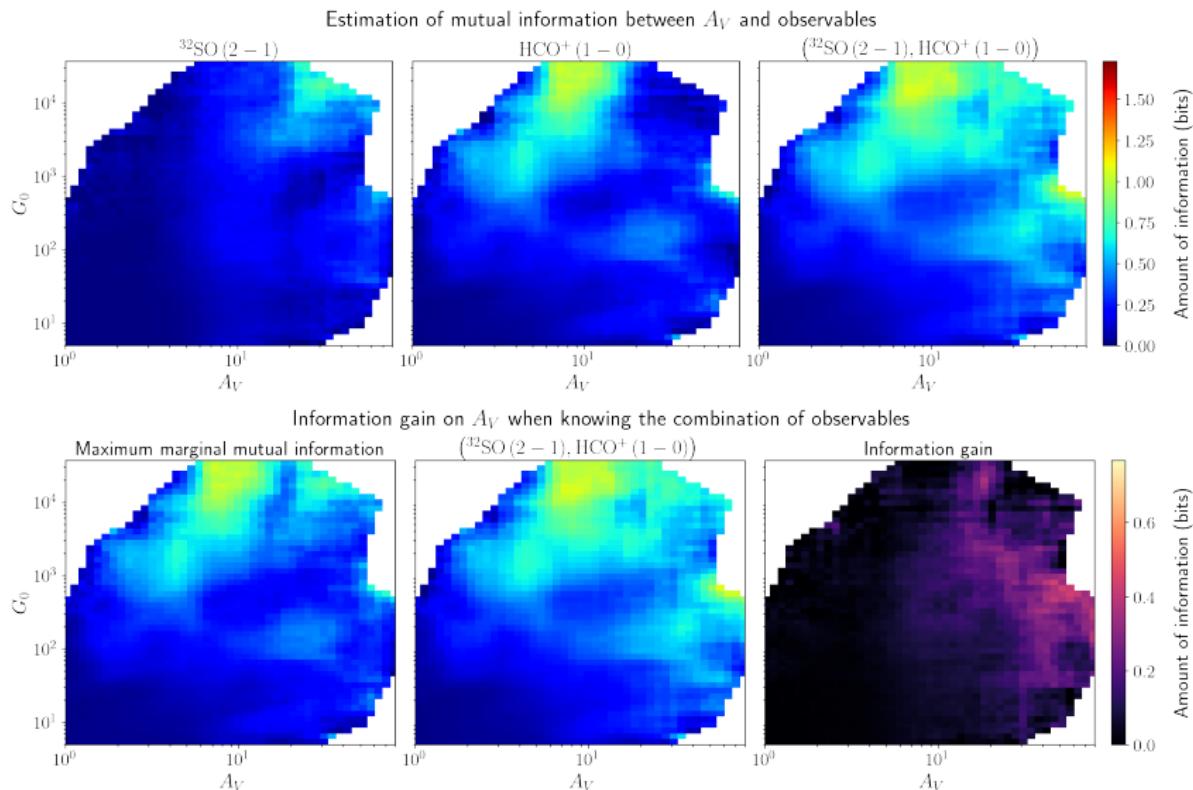
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{HCO}^+ (1 - 0))$



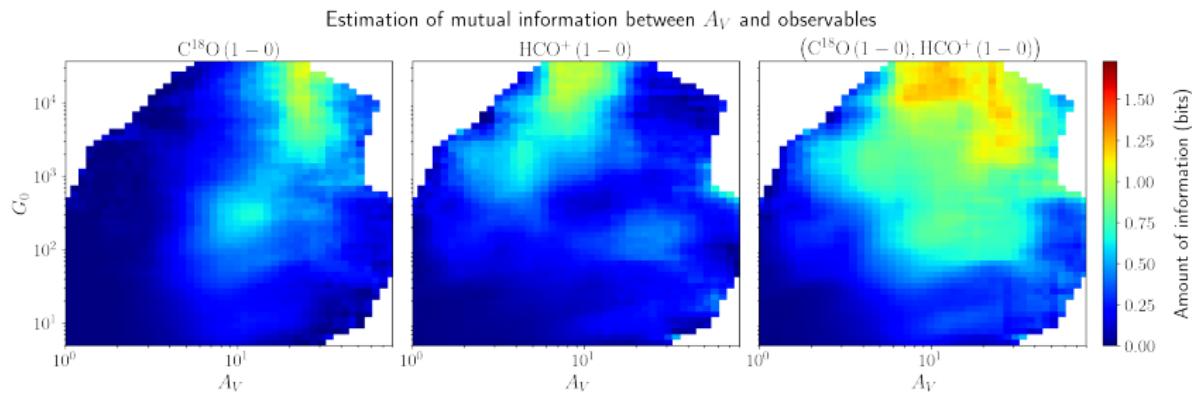
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{HCO}^+ (1 - 0))$



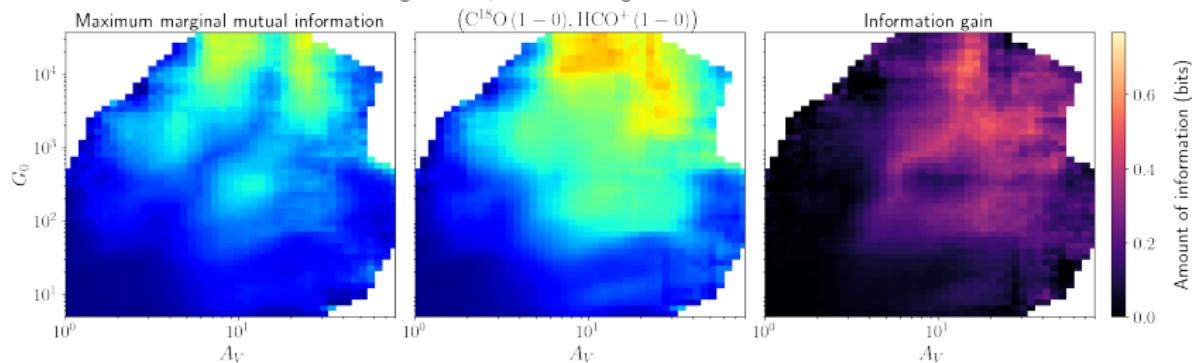
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{HCO}^+ (1 - 0))$



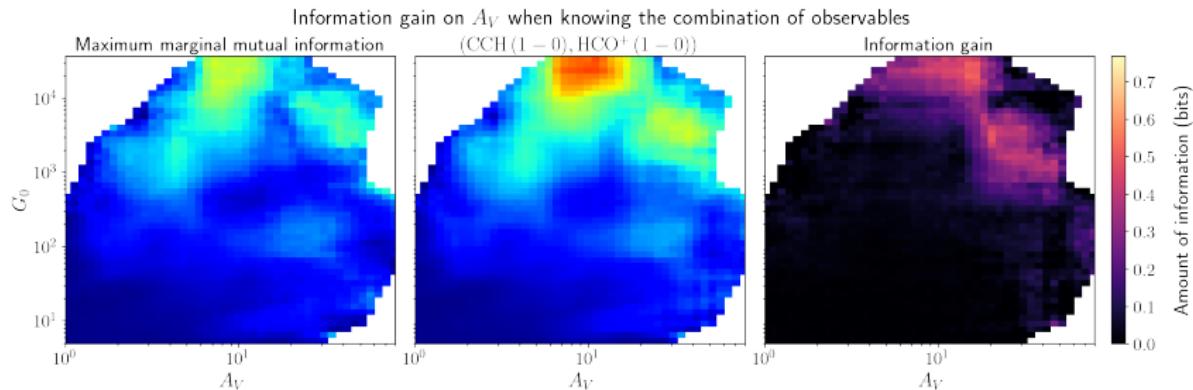
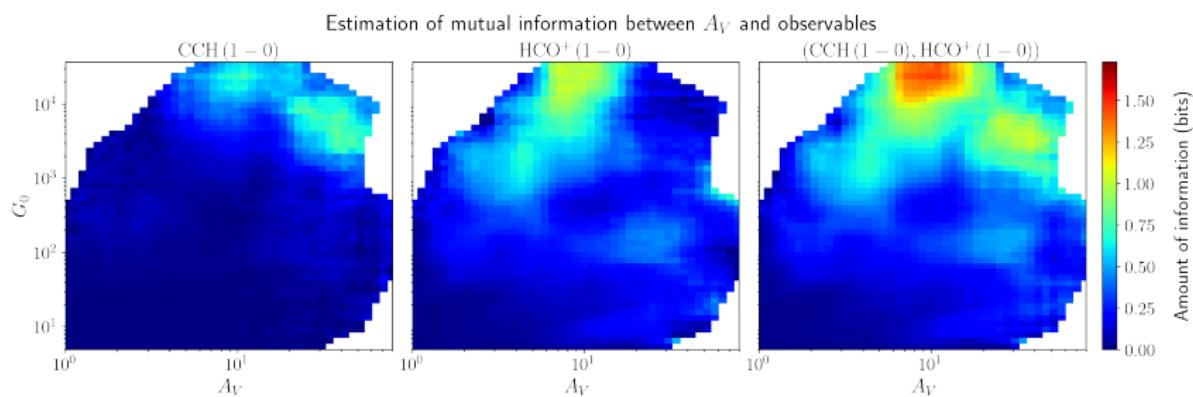
Informativity on A_V of $(C^{18}O(1 - 0), HCO^+(1 - 0))$



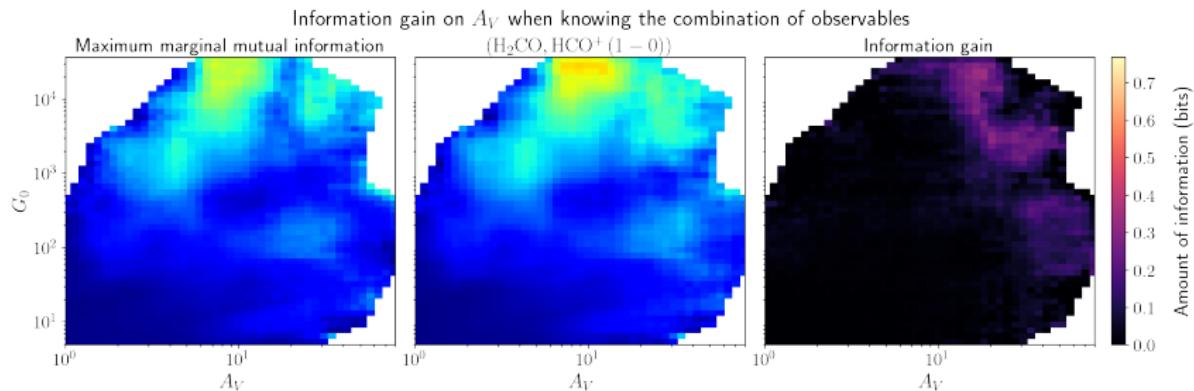
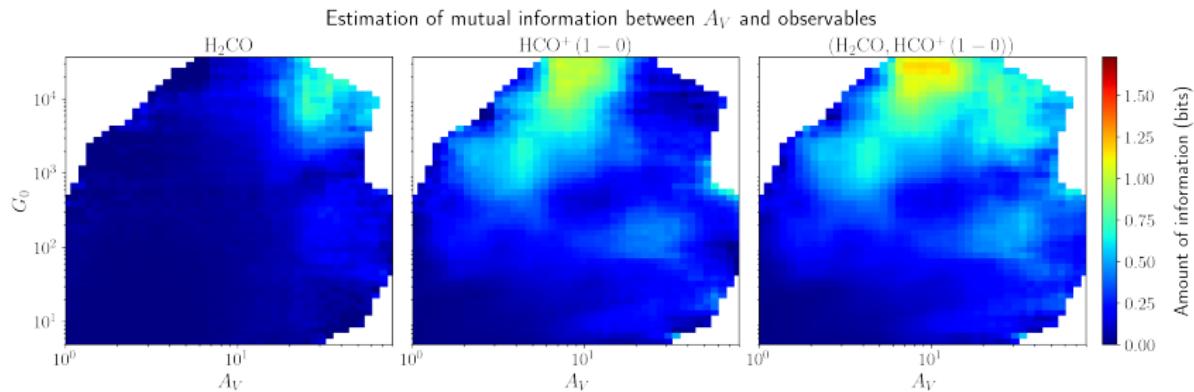
Information gain on A_V when knowing the combination of observables



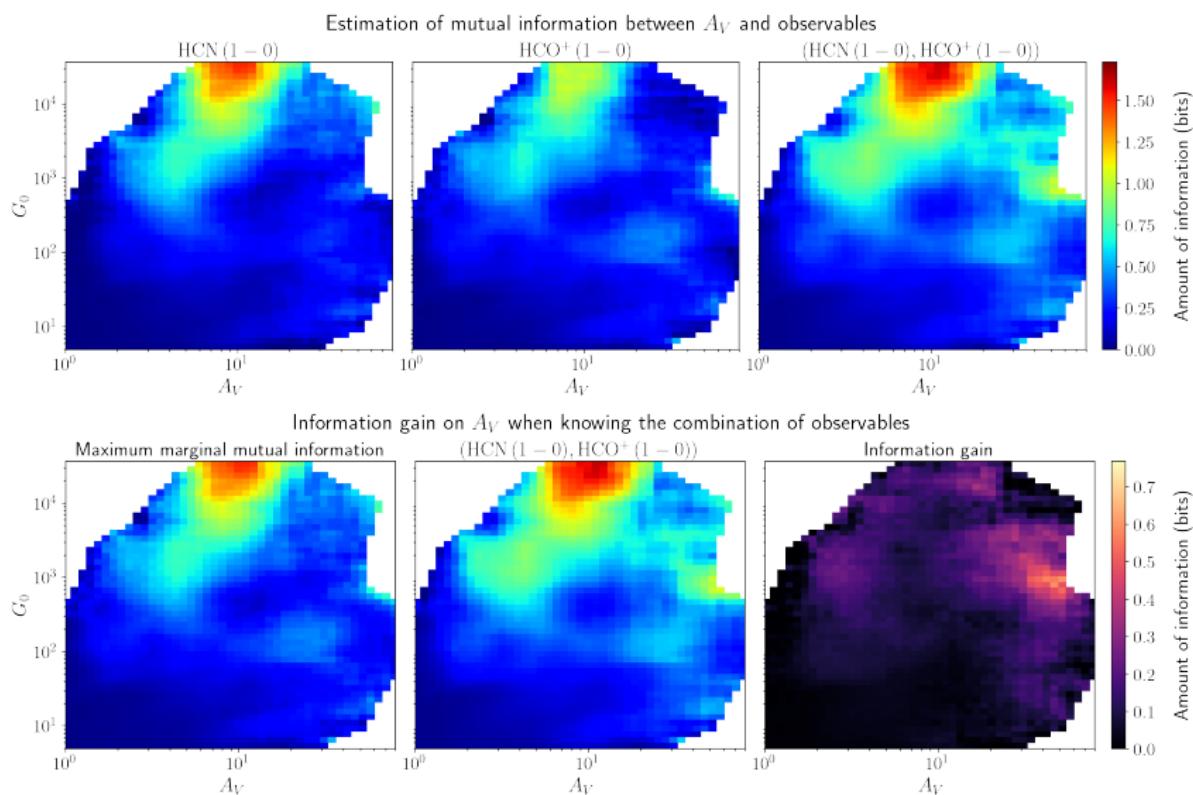
Informativity on A_V of $(\text{CCH}(1 - 0), \text{HCO}^+(1 - 0))$



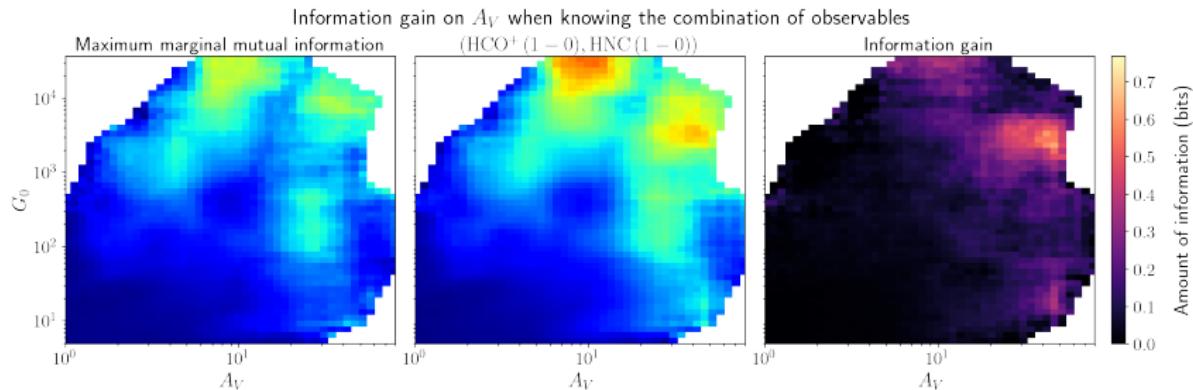
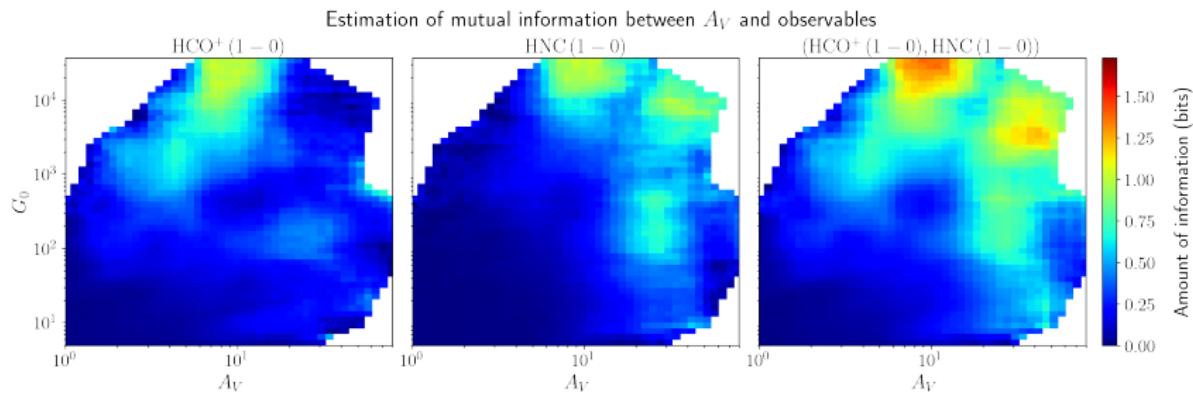
Informativity on A_V of (H_2CO , $\text{HCO}^+ (1 - 0)$)



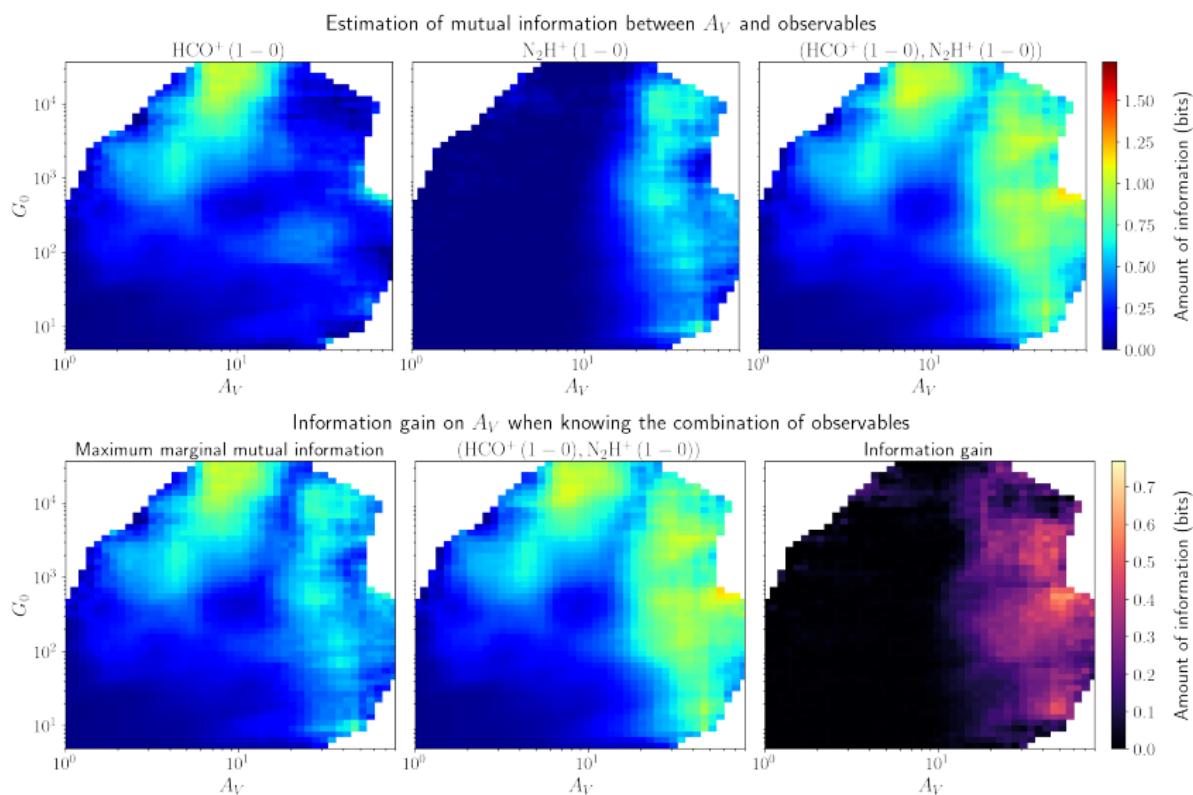
Informativity on A_V of (HCN (1 – 0), HCO $^+$ (1 – 0))



Informativity on A_V of $(\text{HCO}^+ (1 - 0), \text{HNC} (1 - 0))$



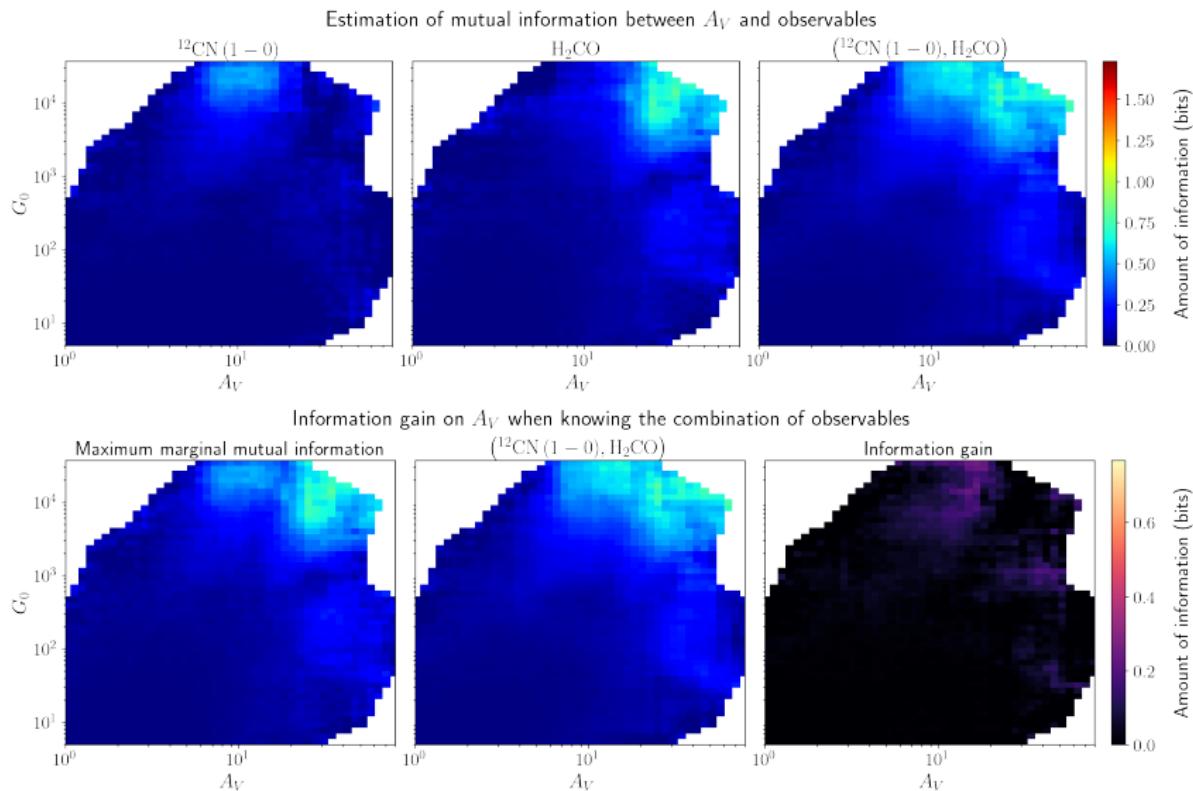
Informativity on A_V of ($\text{HCO}^+ (1 - 0)$, $\text{N}_2\text{H}^+ (1 - 0)$)



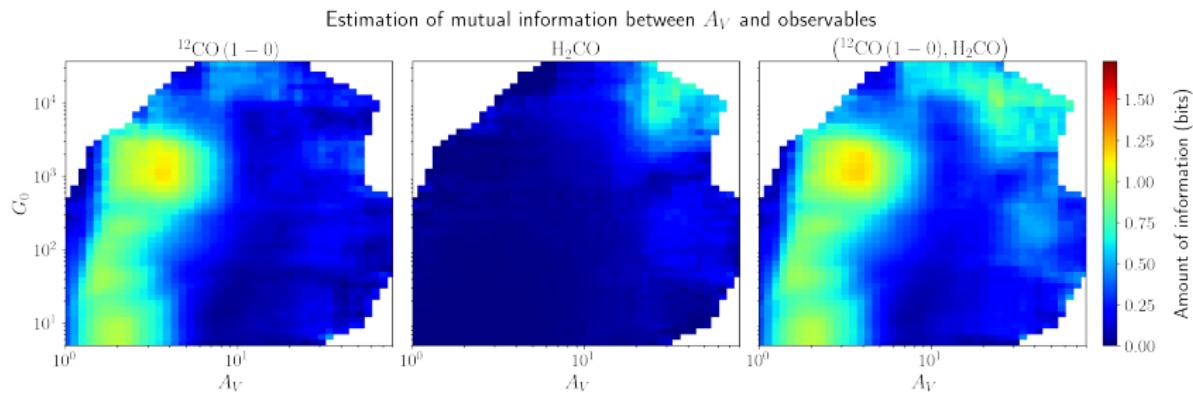
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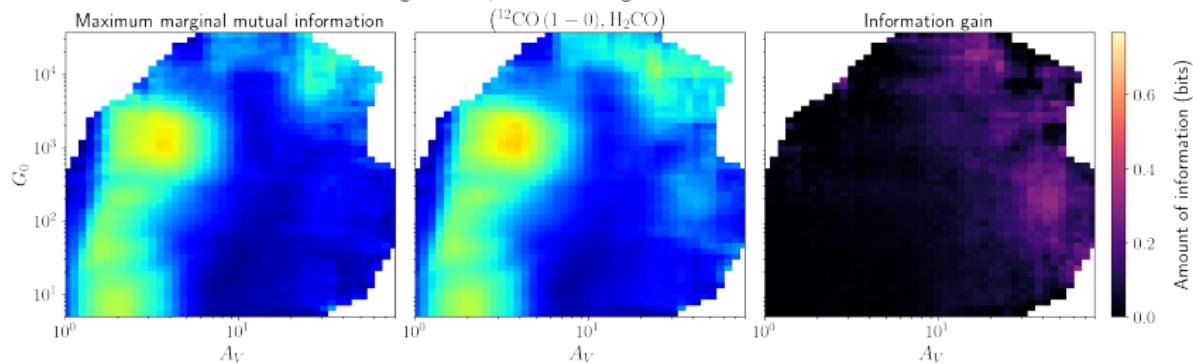
Informativity on A_V of $(^{12}\text{CN} (1 - 0), \text{H}_2\text{CO})$



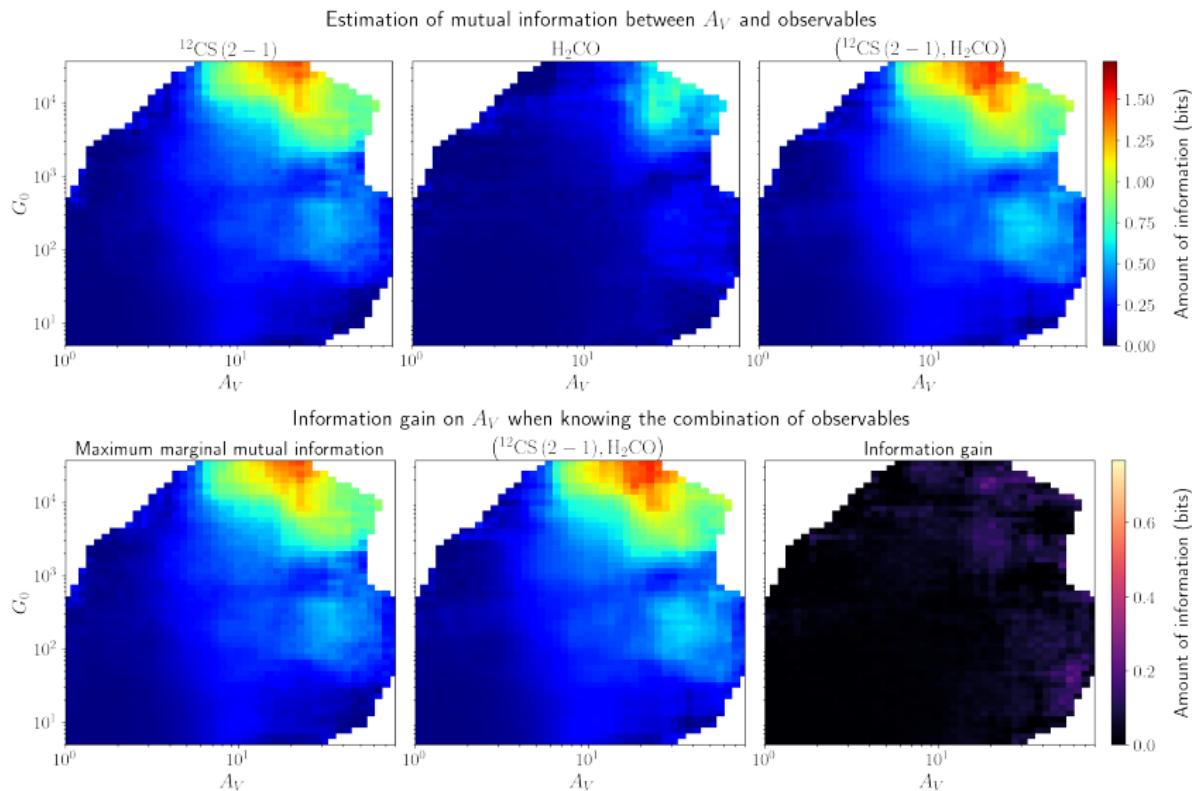
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{H}_2\text{CO})$



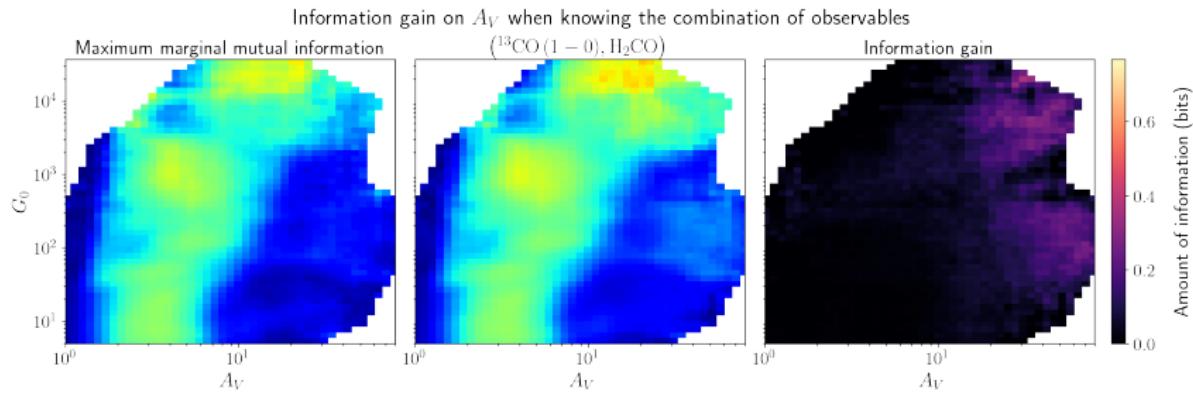
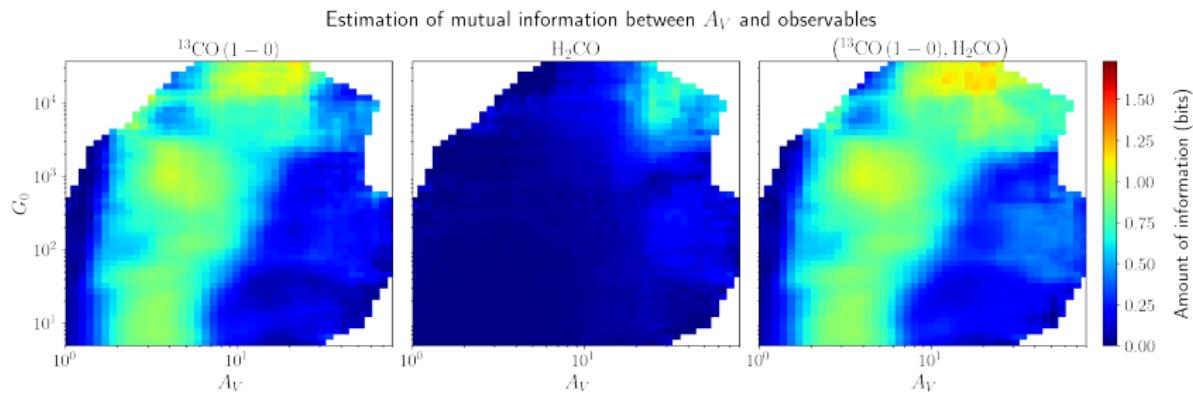
Information gain on A_V when knowing the combination of observables



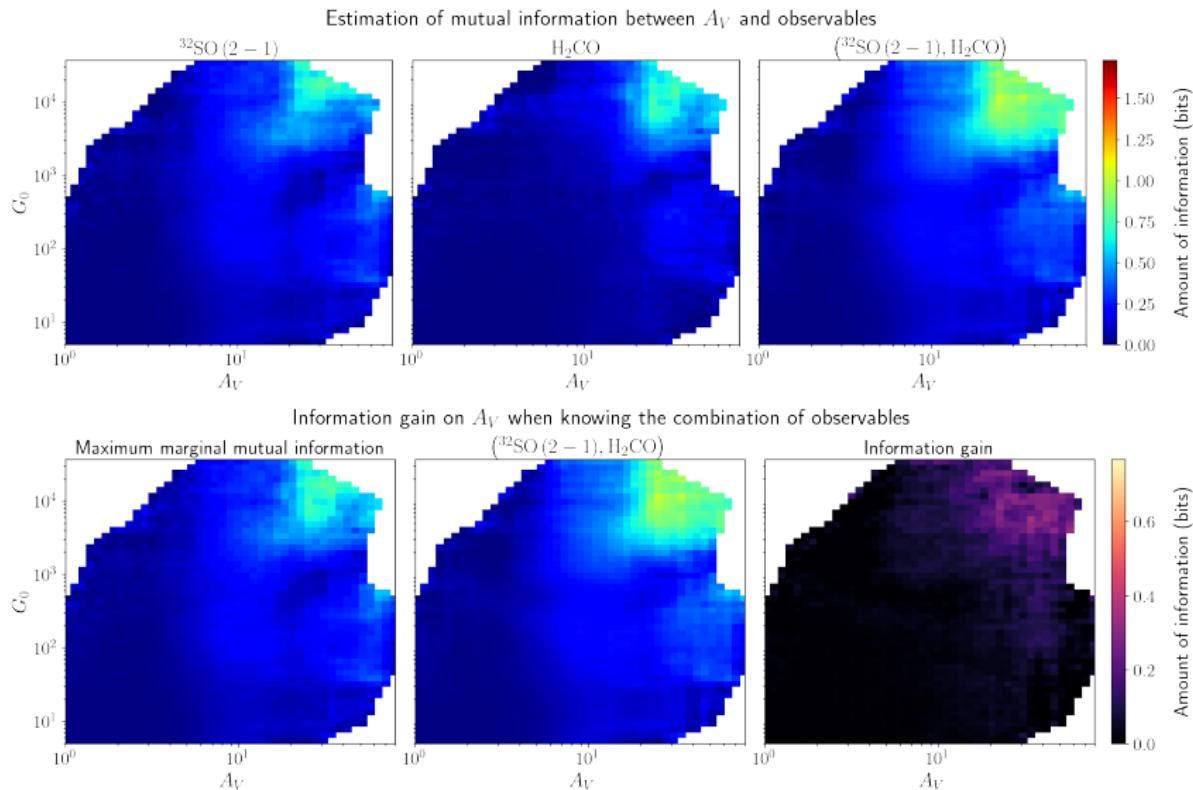
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{H}_2\text{CO})$



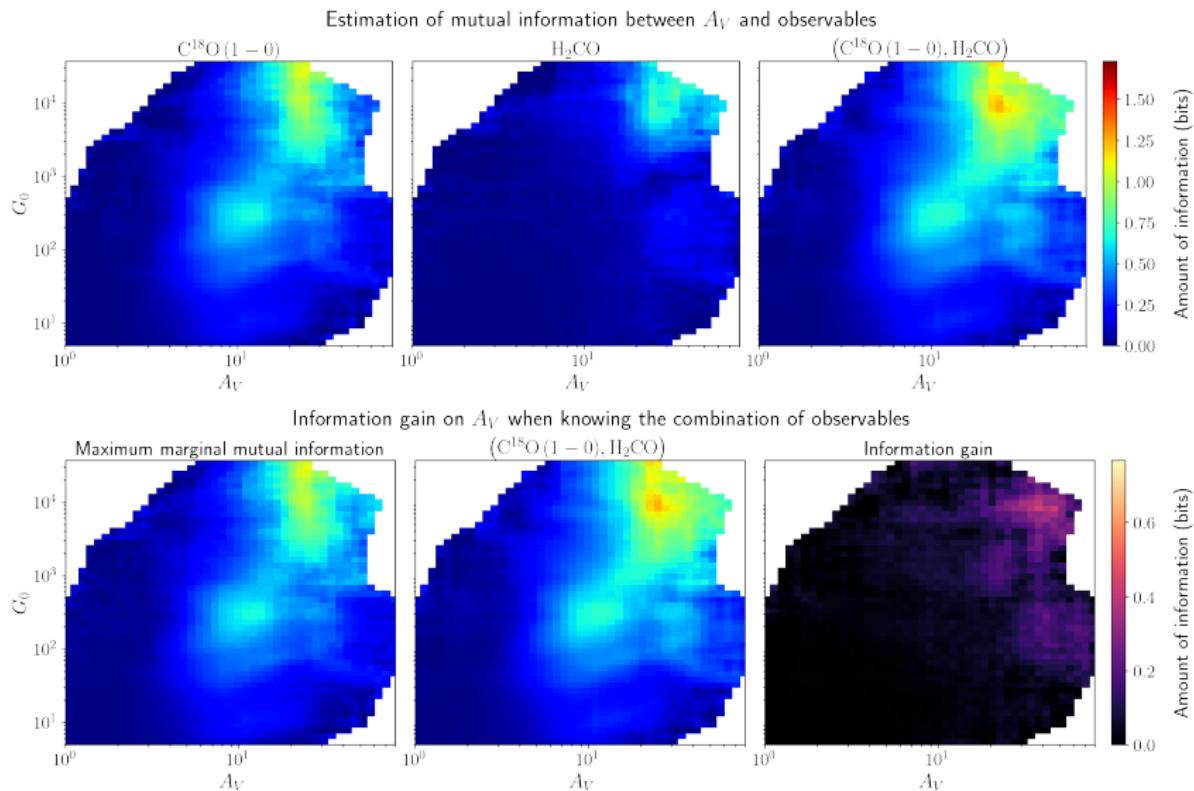
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{H}_2\text{CO})$



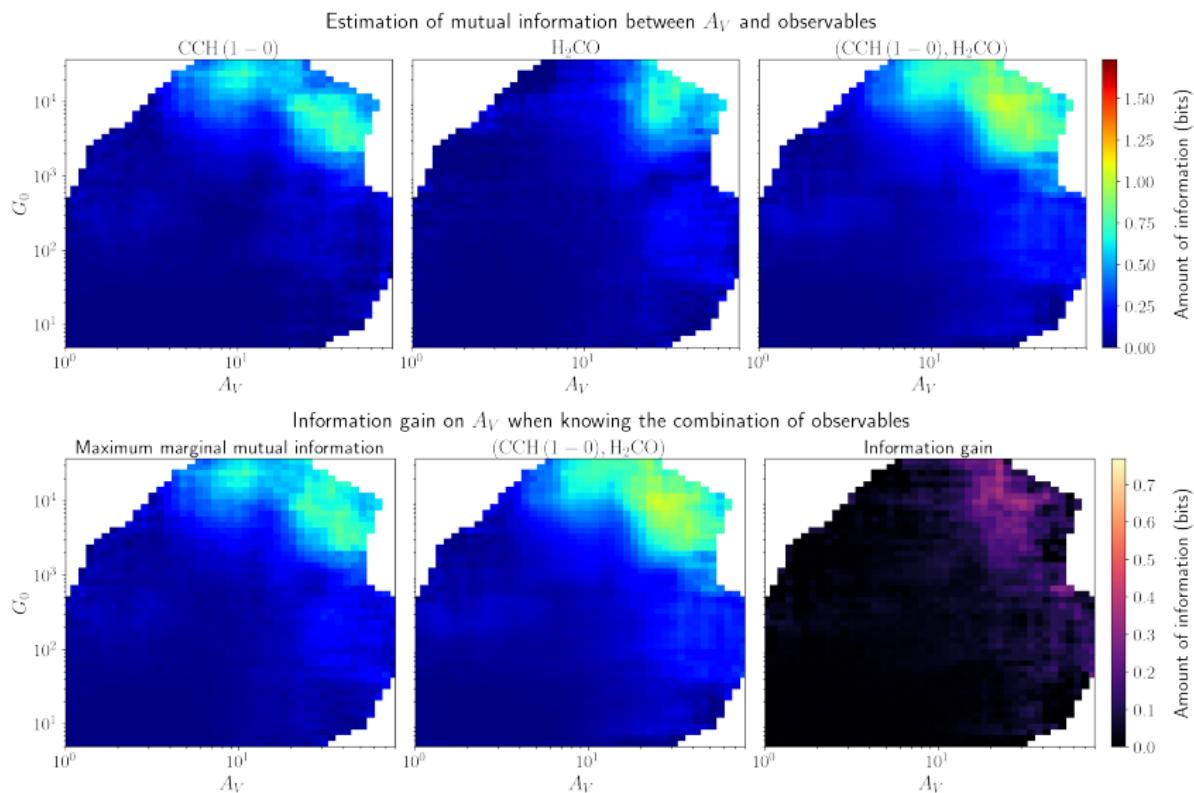
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{H}_2\text{CO})$



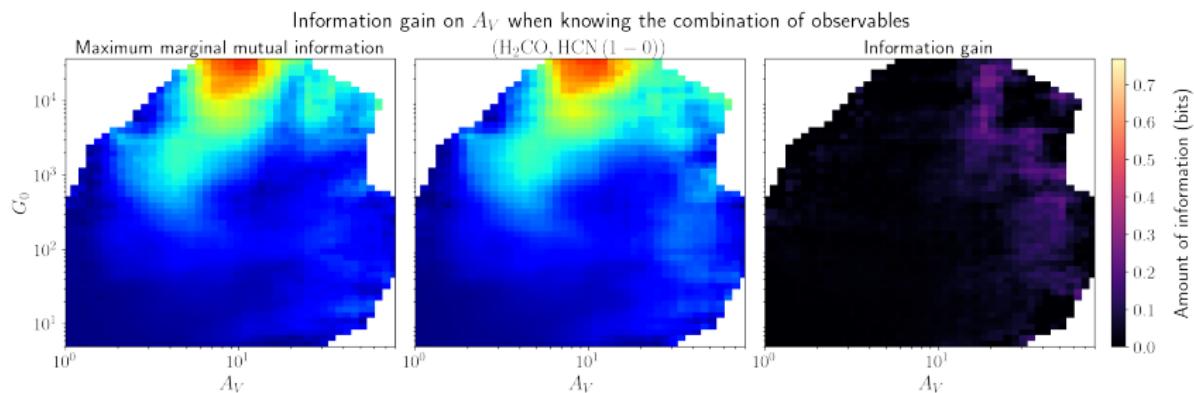
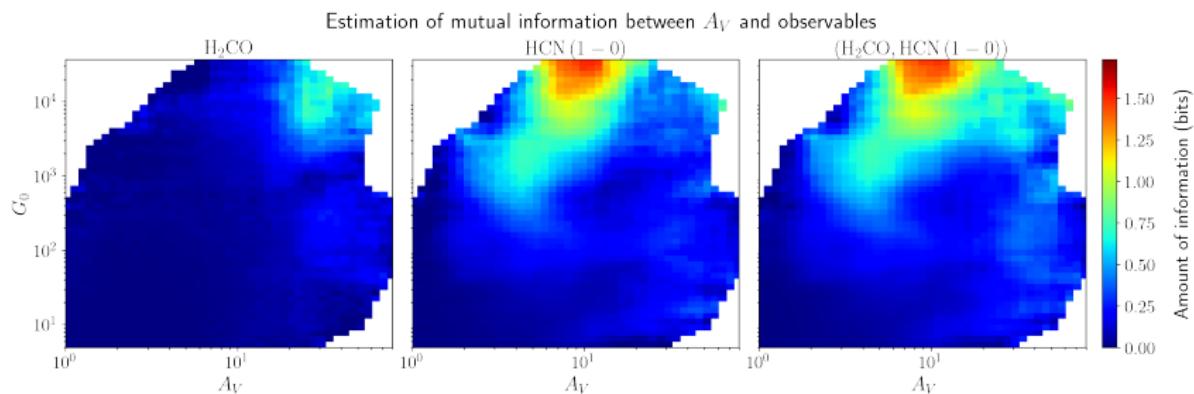
Informativity on A_V of $(C^{18}O(1 - 0), H_2CO)$



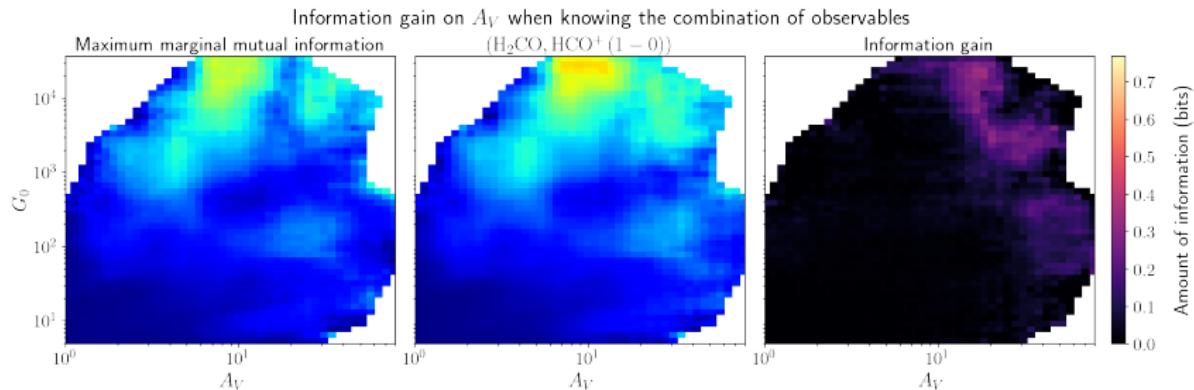
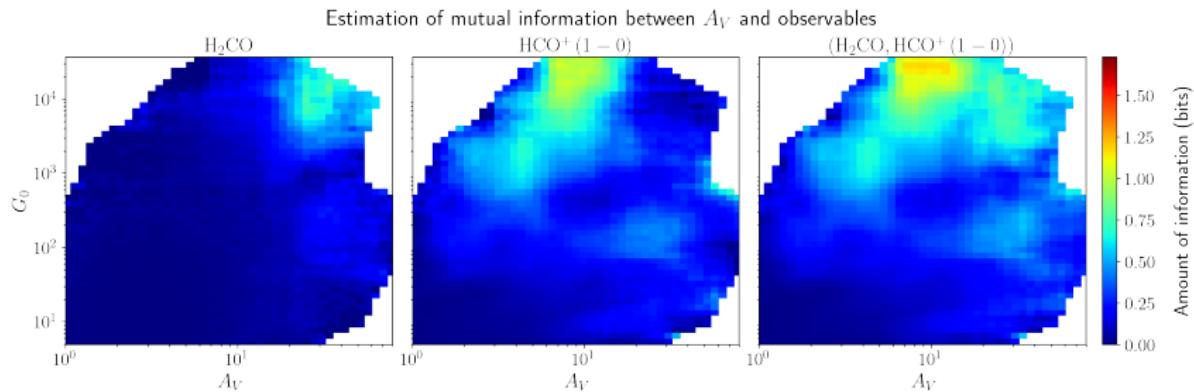
Informativity on A_V of $(\text{CCH}(1 - 0), \text{H}_2\text{CO})$



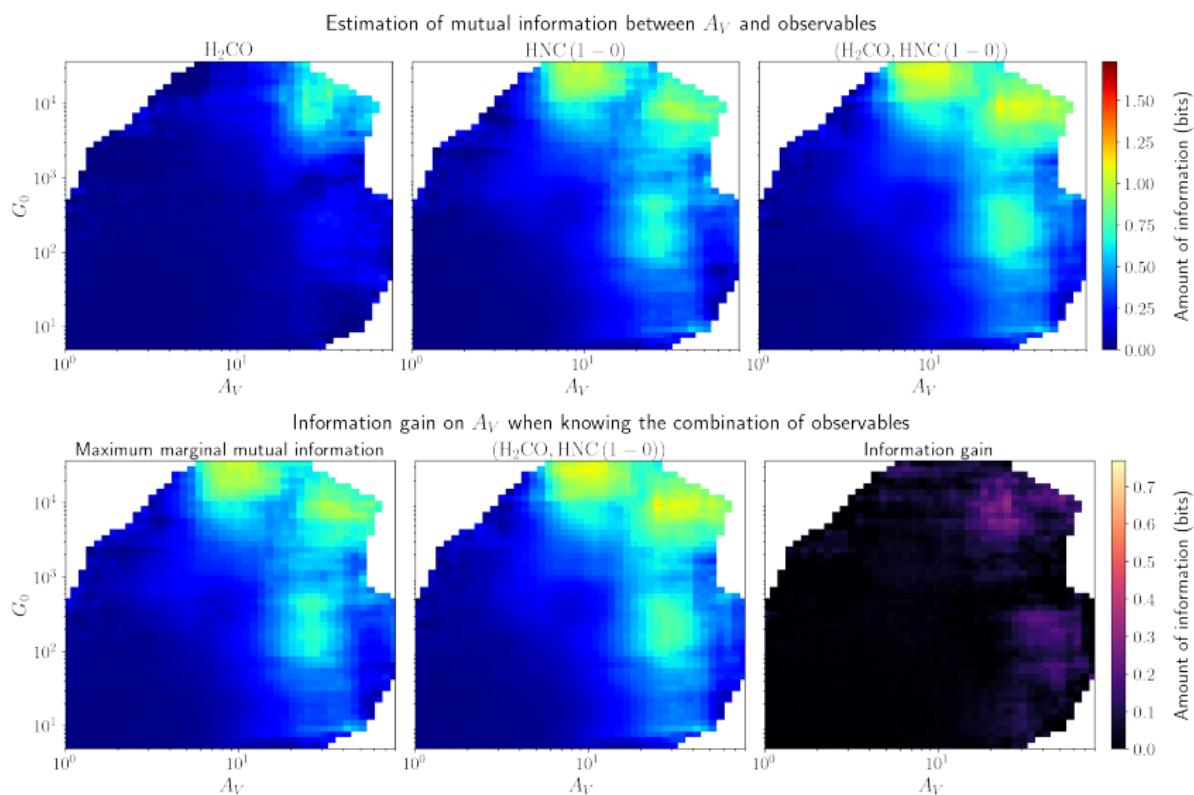
Informativity on A_V of (H_2CO , $\text{HCN} (1 - 0)$)



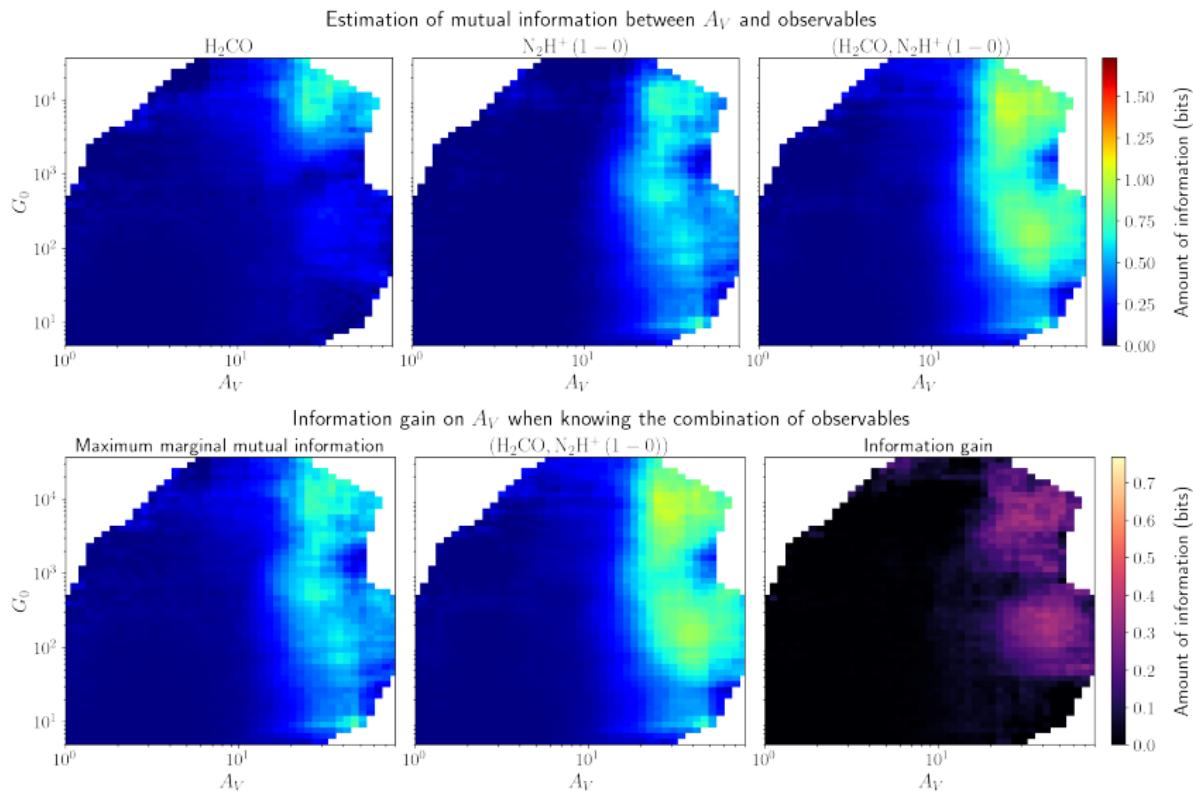
Informativity on A_V of (H_2CO , $\text{HCO}^+ (1 - 0)$)



Informativity on A_V of (H_2CO , $\text{HNC}(1 - 0)$)



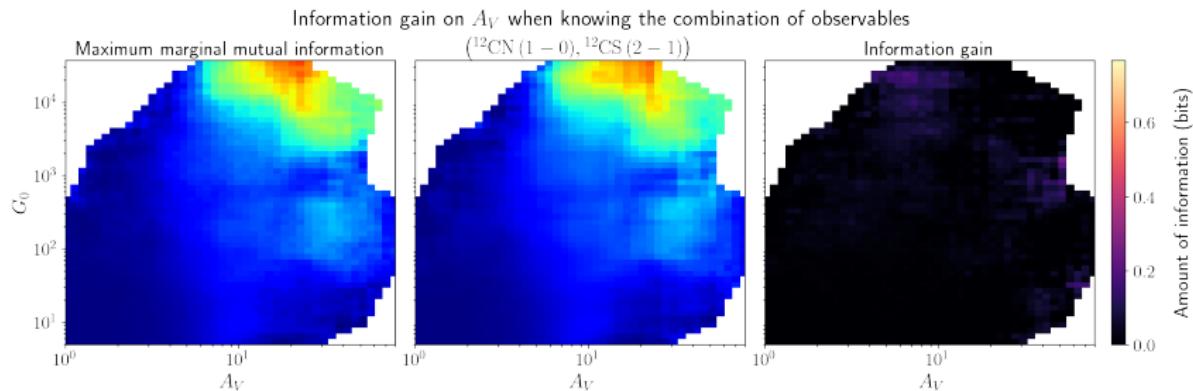
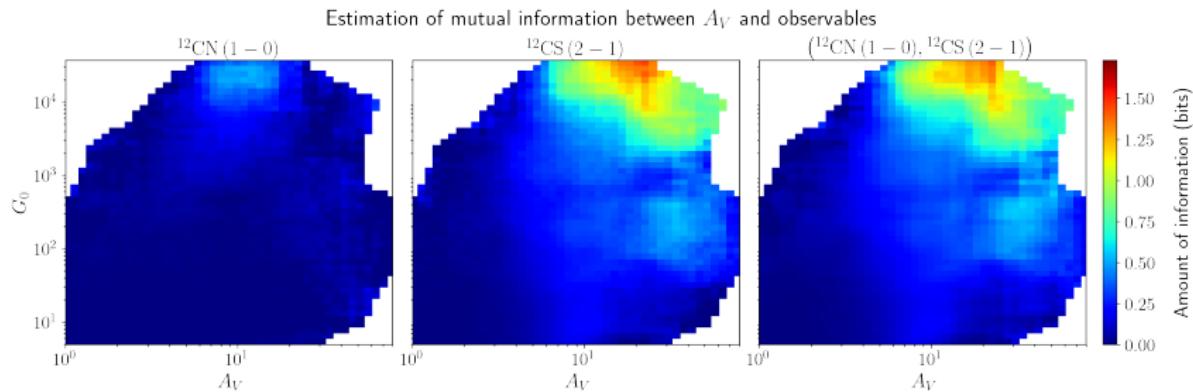
Informativity on A_V of (H_2CO , $\text{N}_2\text{H}^+ (1 - 0)$)



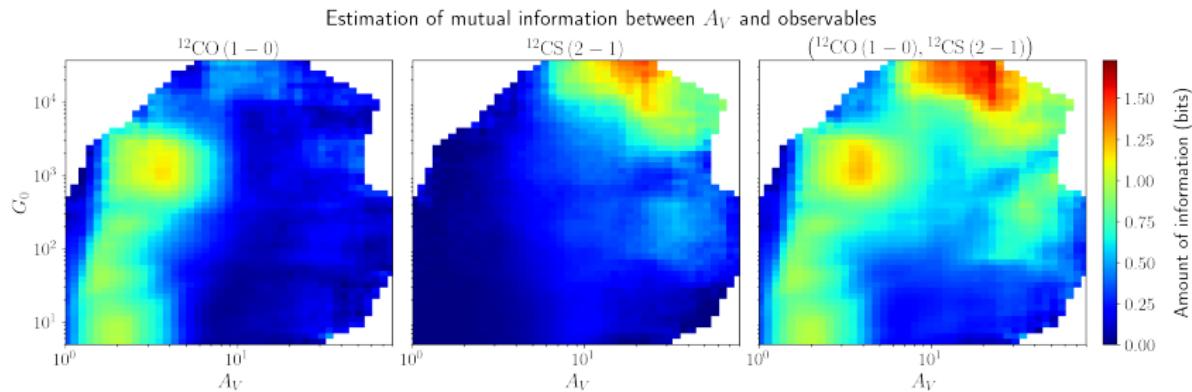
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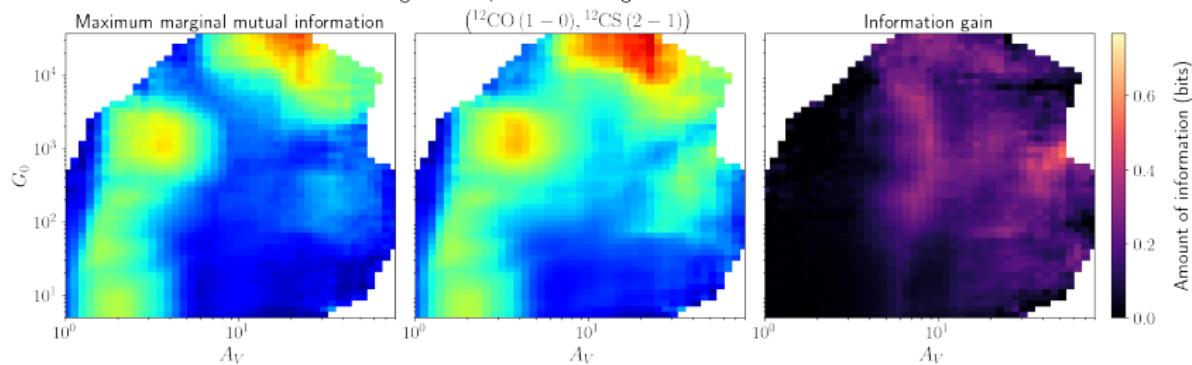
Informativity on A_V of $(^{12}\text{CN}\,(1-0), ^{12}\text{CS}\,(2-1))$



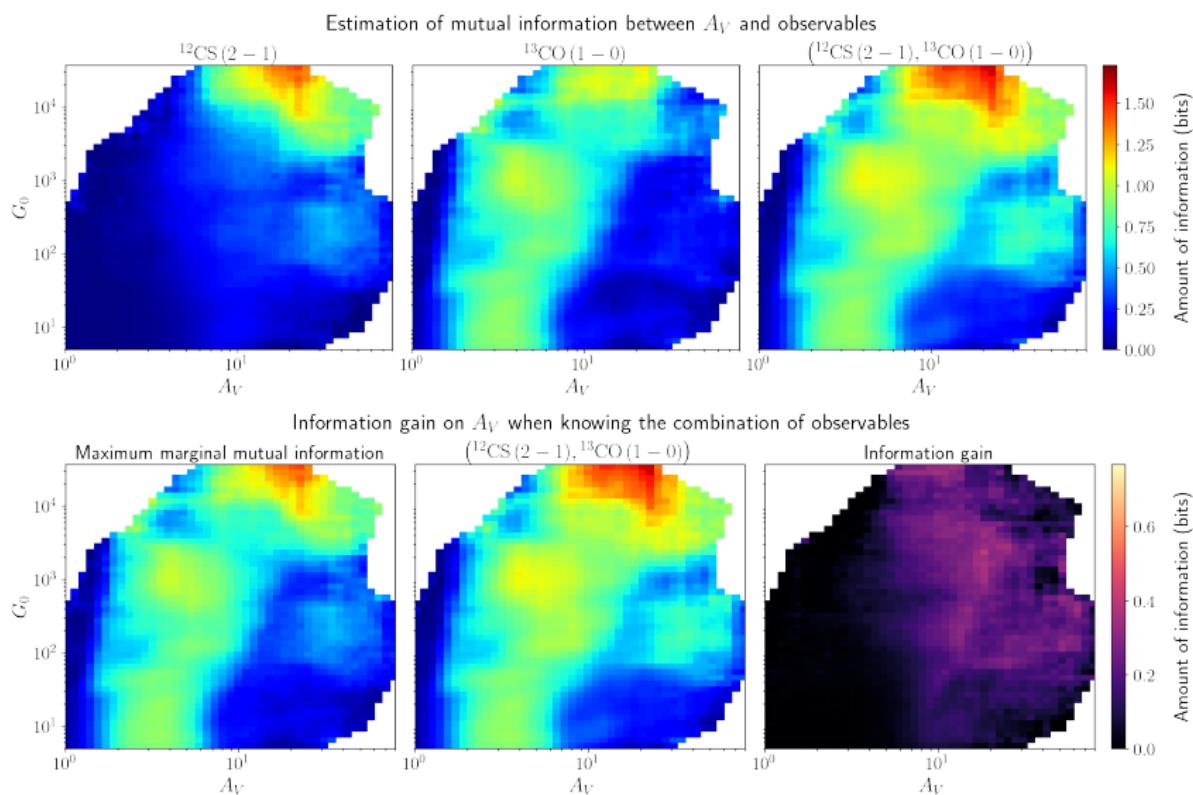
Informativity on A_V of $(^{12}\text{CO} (1 - 0), ^{12}\text{CS} (2 - 1))$



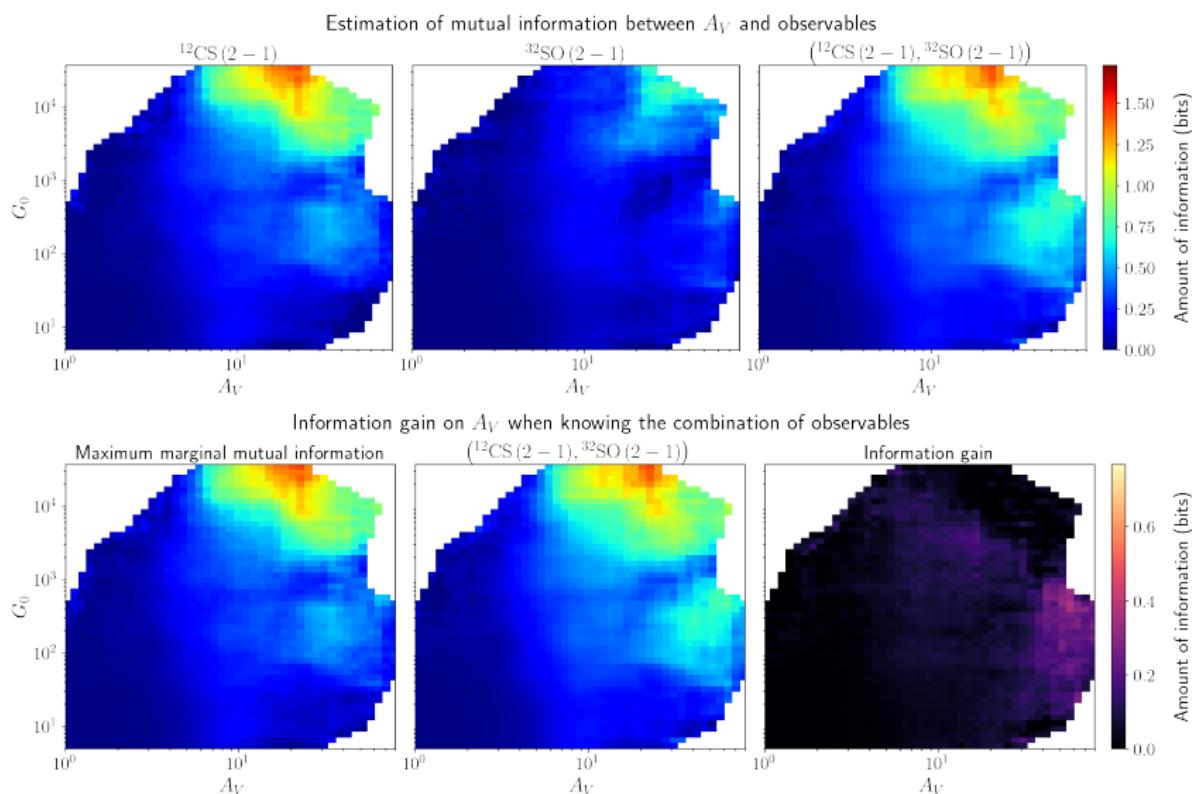
Information gain on A_V when knowing the combination of observables



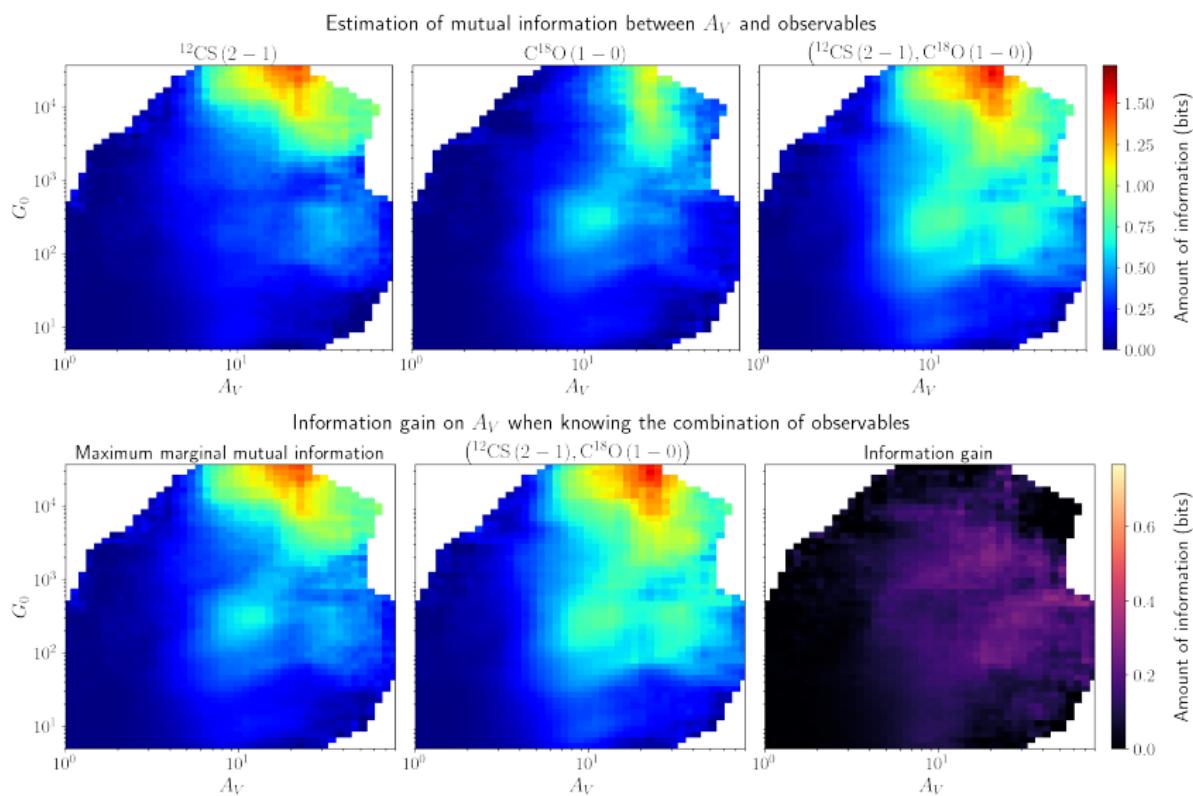
Informativity on A_V of $(^{12}\text{CS} (2 - 1), ^{13}\text{CO} (1 - 0))$



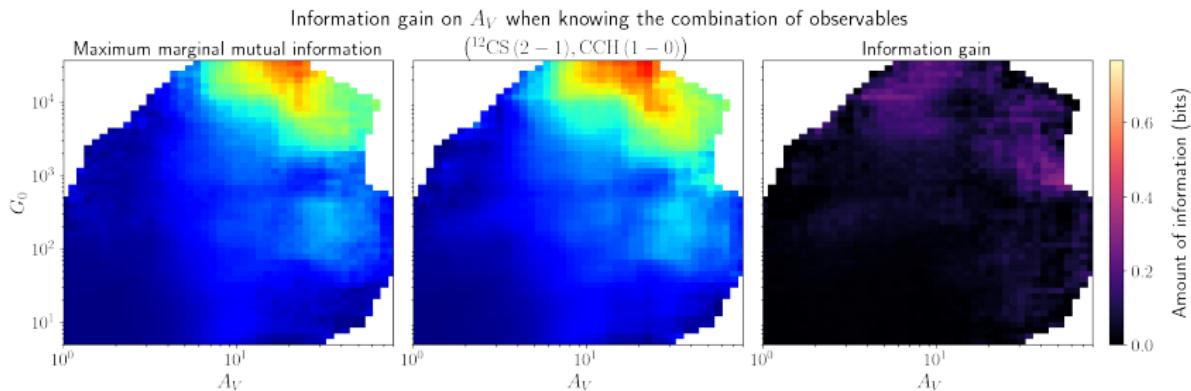
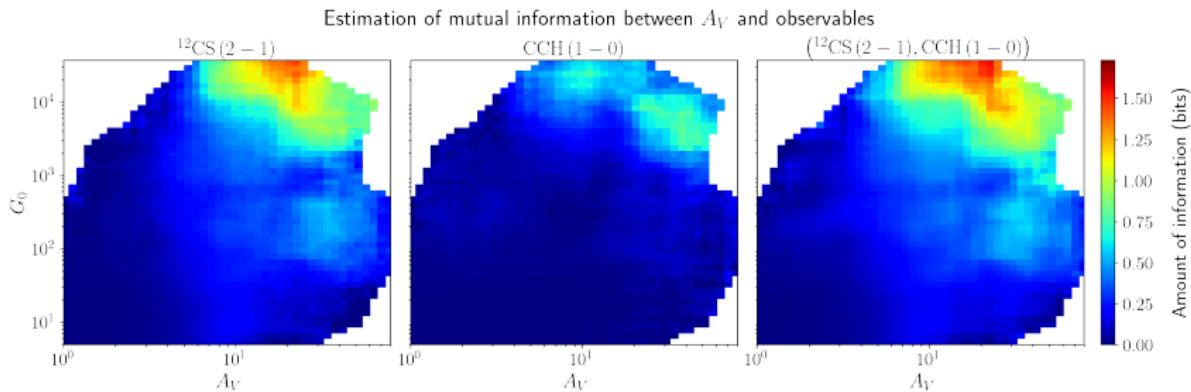
Informativity on A_V of $(^{12}\text{CS} (2 - 1), ^{32}\text{SO} (2 - 1))$



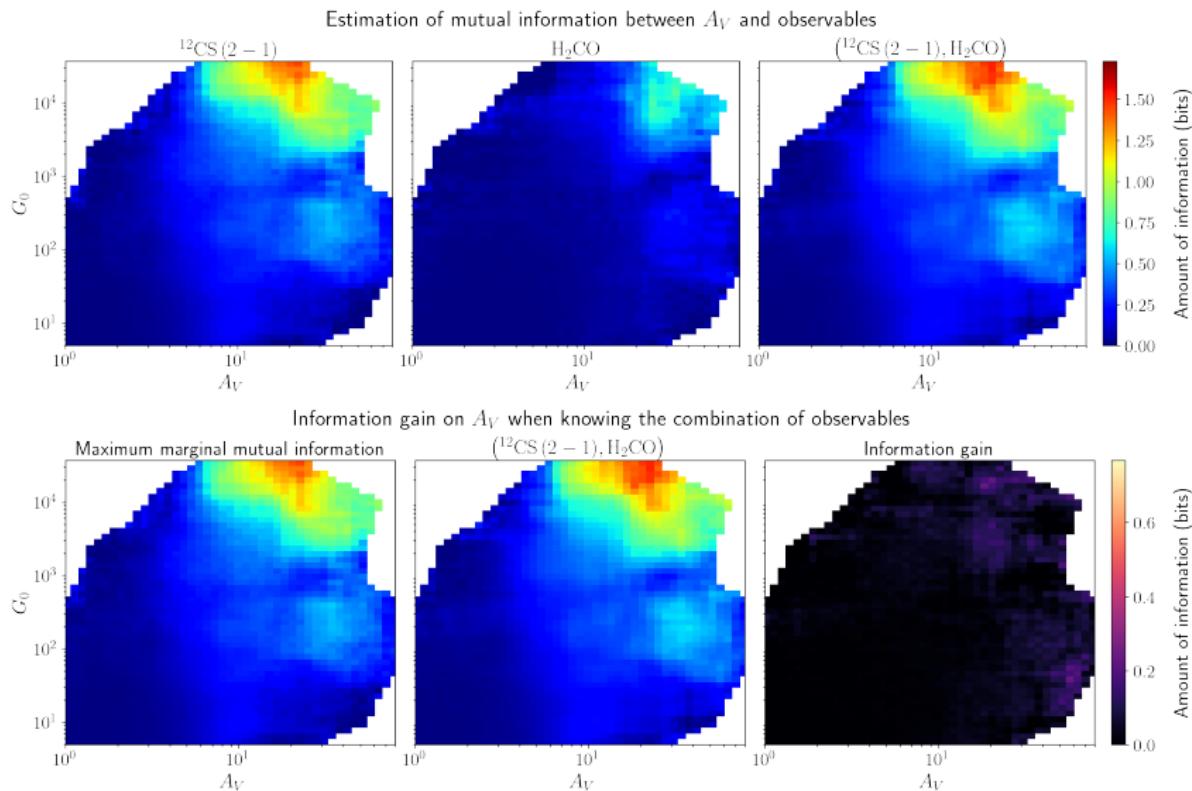
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{C}^{18}\text{O} (1 - 0))$



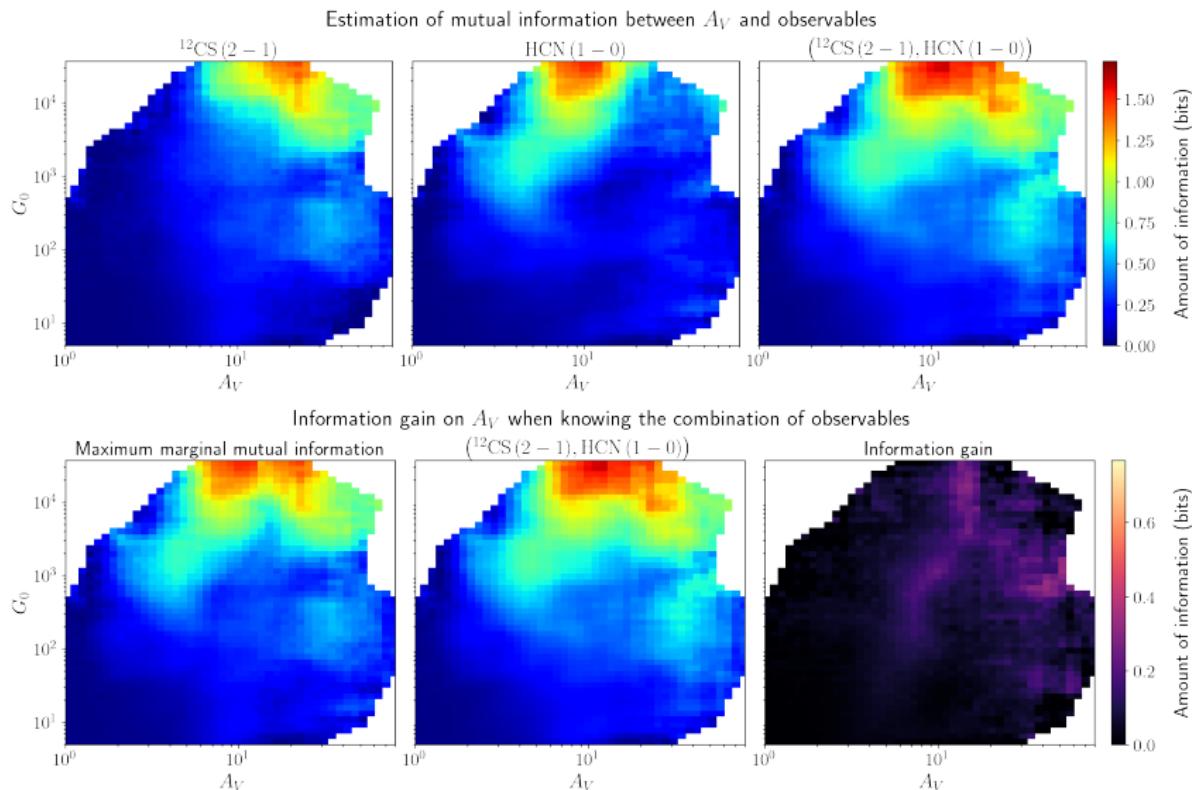
Informativity on A_V of $(^{12}\text{CS}(2 - 1), \text{CCH}(1 - 0))$



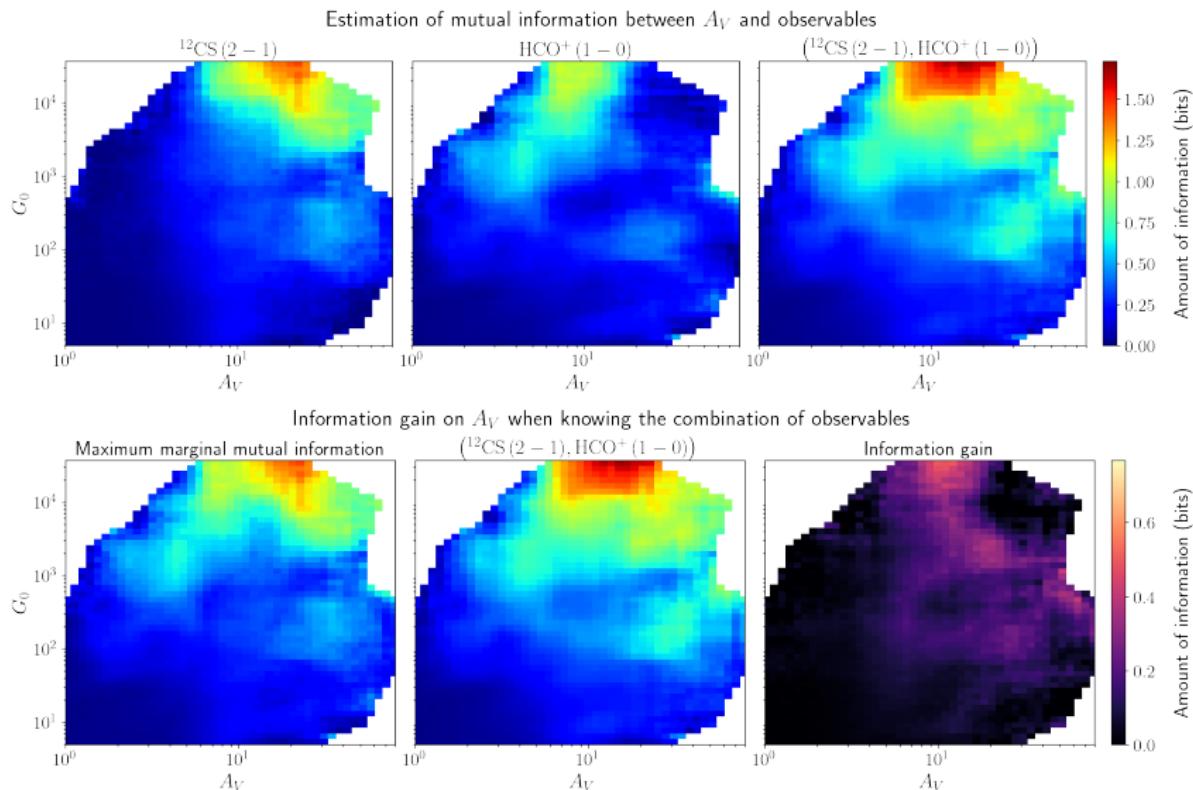
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{H}_2\text{CO})$



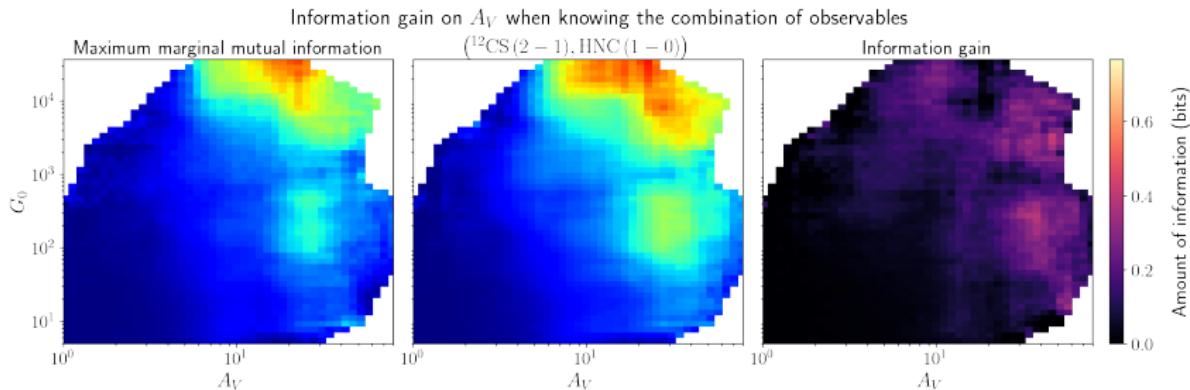
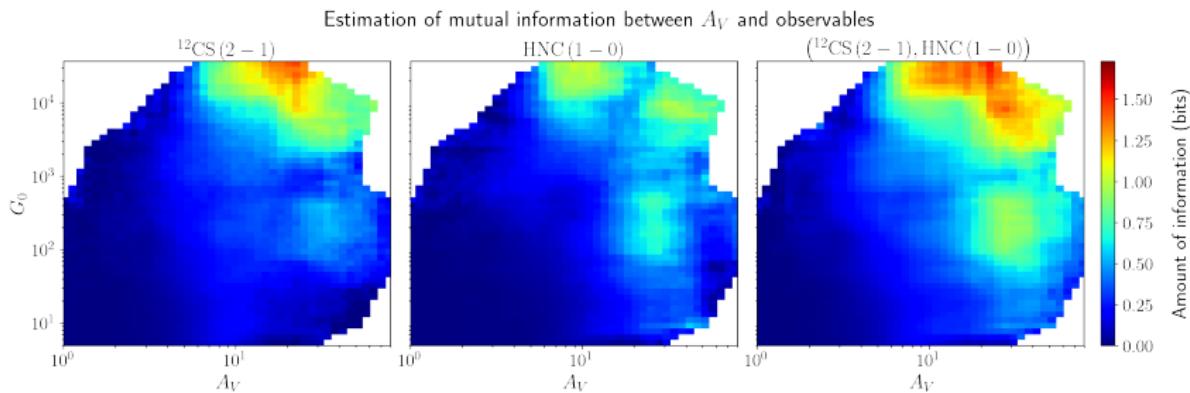
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{HCN} (1 - 0))$



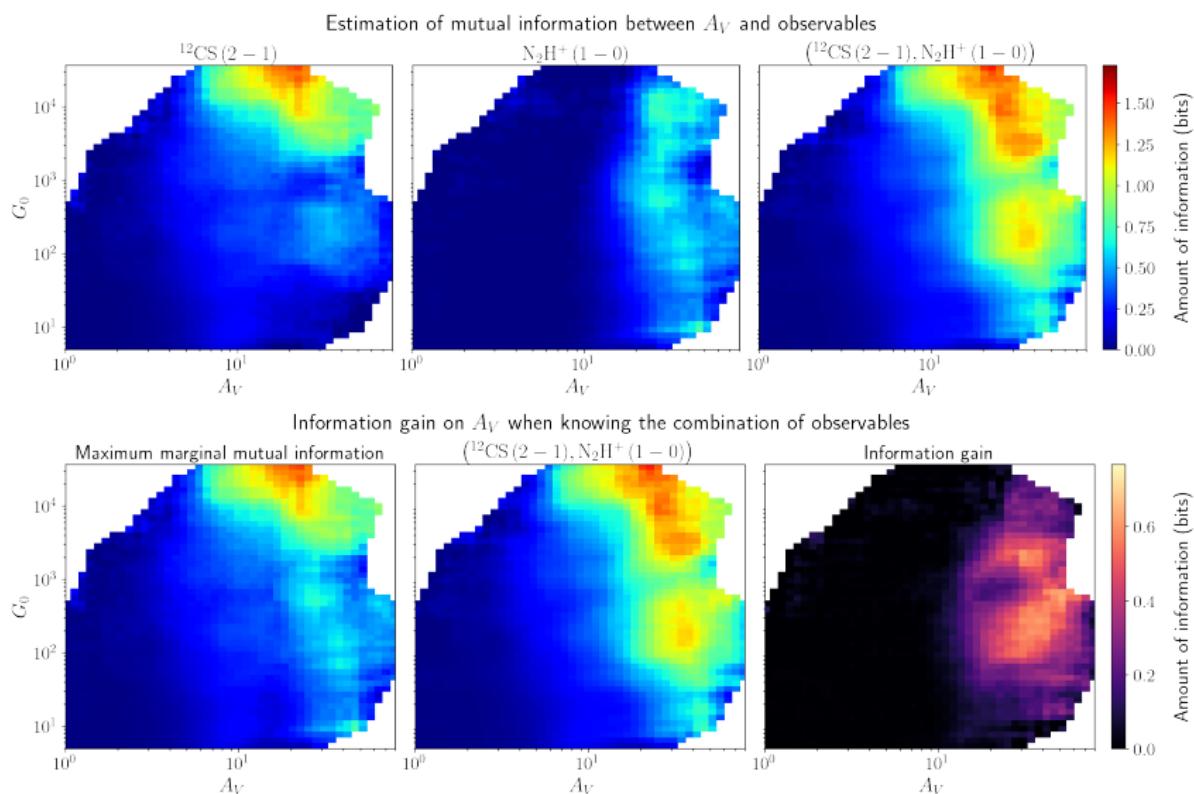
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{HCO}^+ (1 - 0))$



Informativity on A_V of $(^{12}\text{CS}(2 - 1), \text{HNC}(1 - 0))$



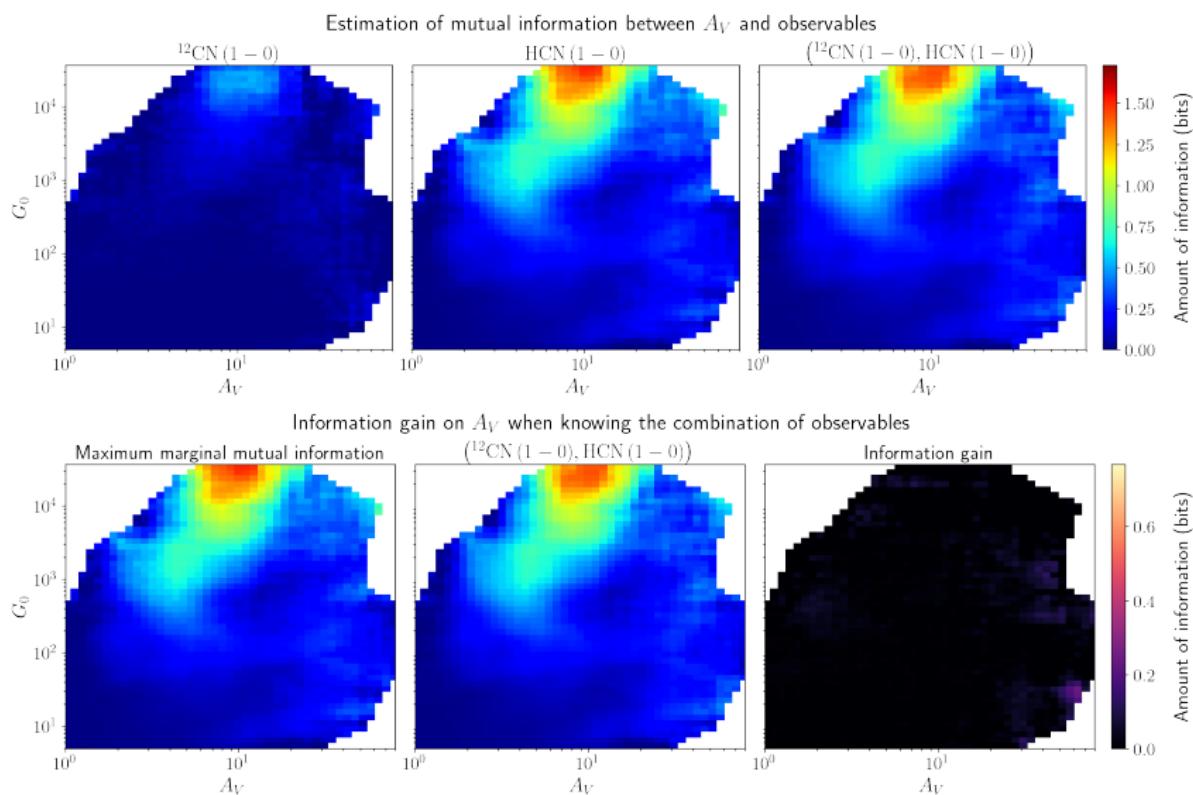
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{N}_2\text{H}^+ (1 - 0))$



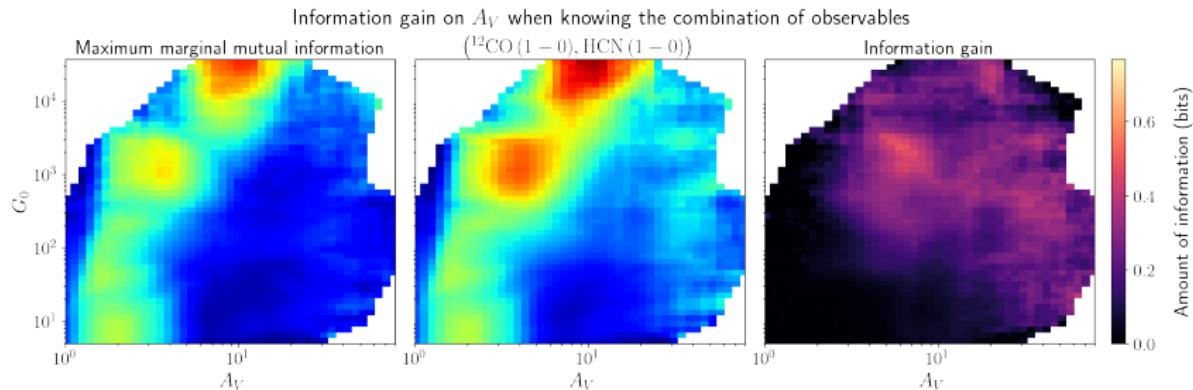
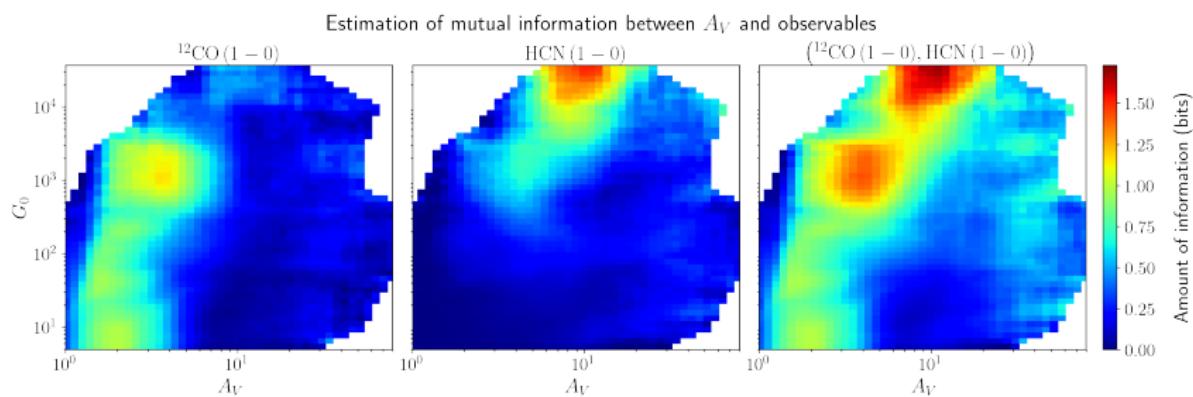
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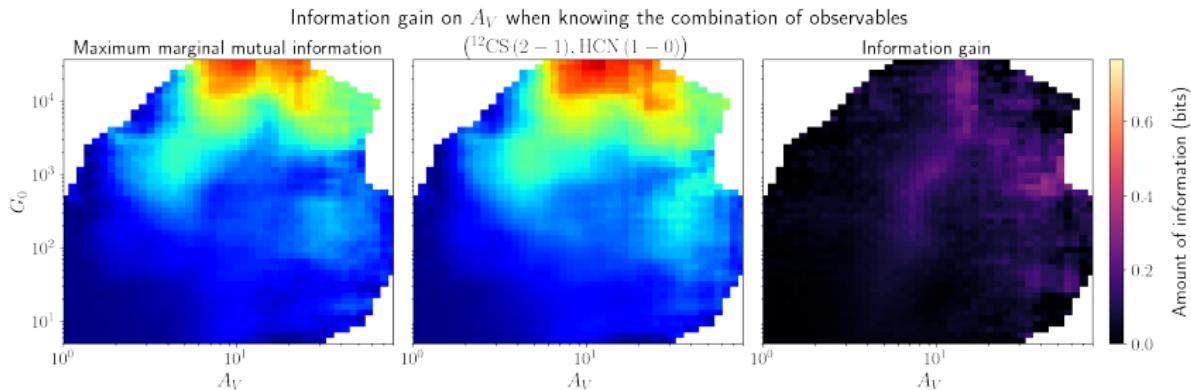
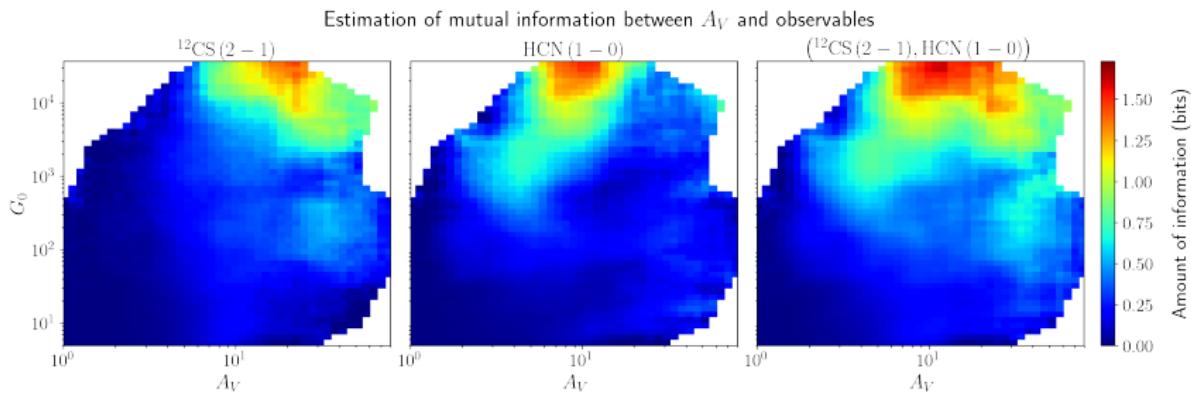
Informativity on A_V of $(^{12}\text{CN}(1 - 0), \text{HCN}(1 - 0))$



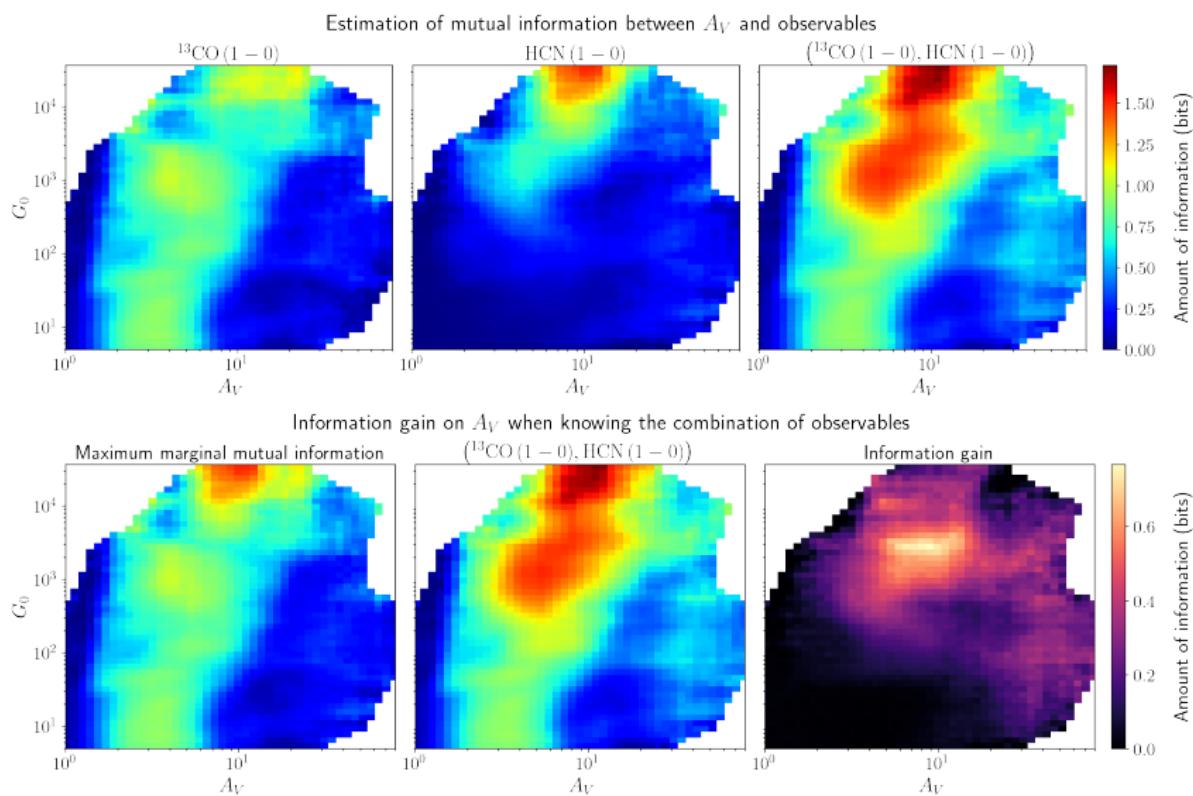
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{HCN} (1 - 0))$



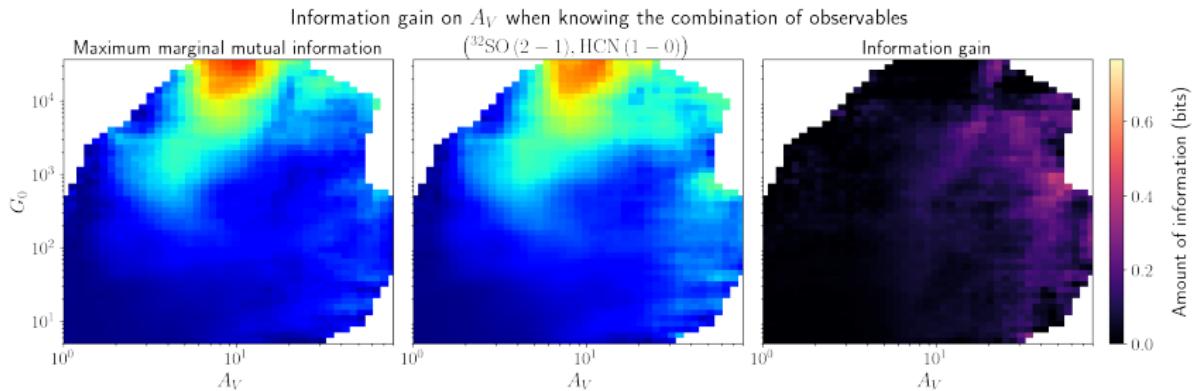
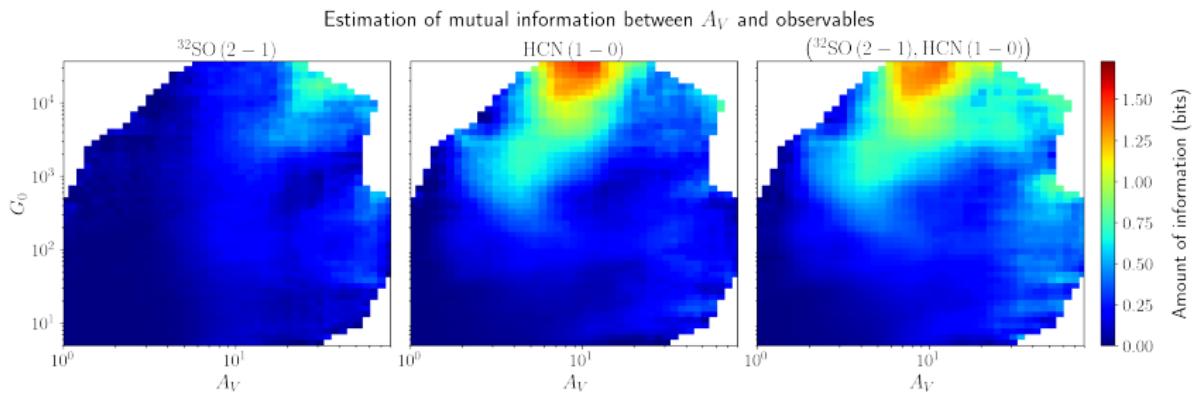
Informativity on A_V of $(^{12}\text{CS} (2 - 1), \text{HCN} (1 - 0))$



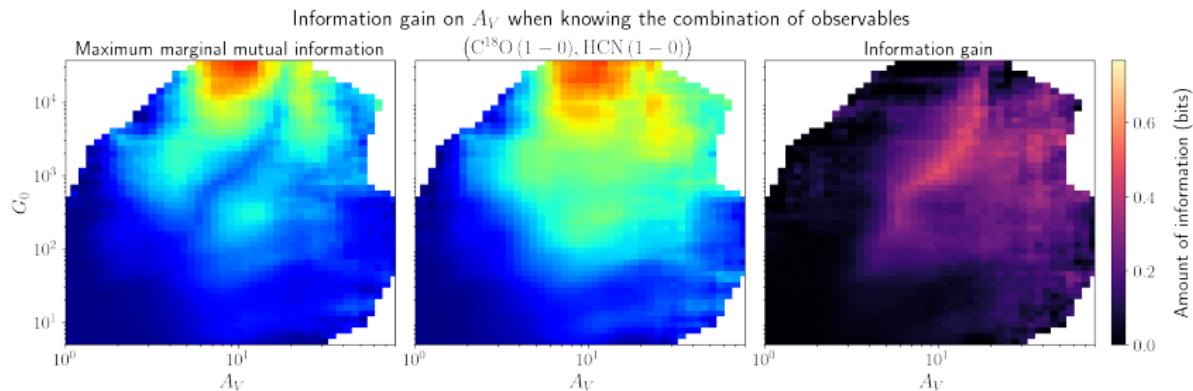
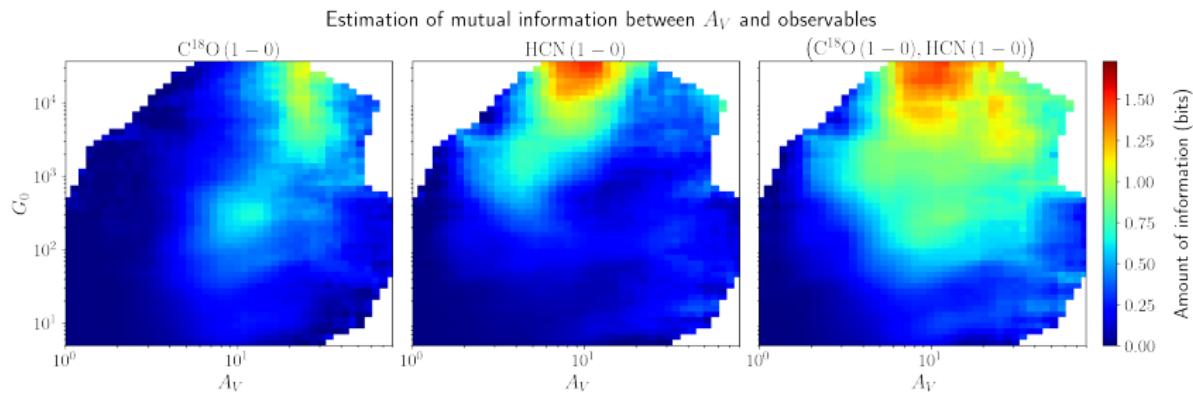
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{HCN} (1 - 0))$



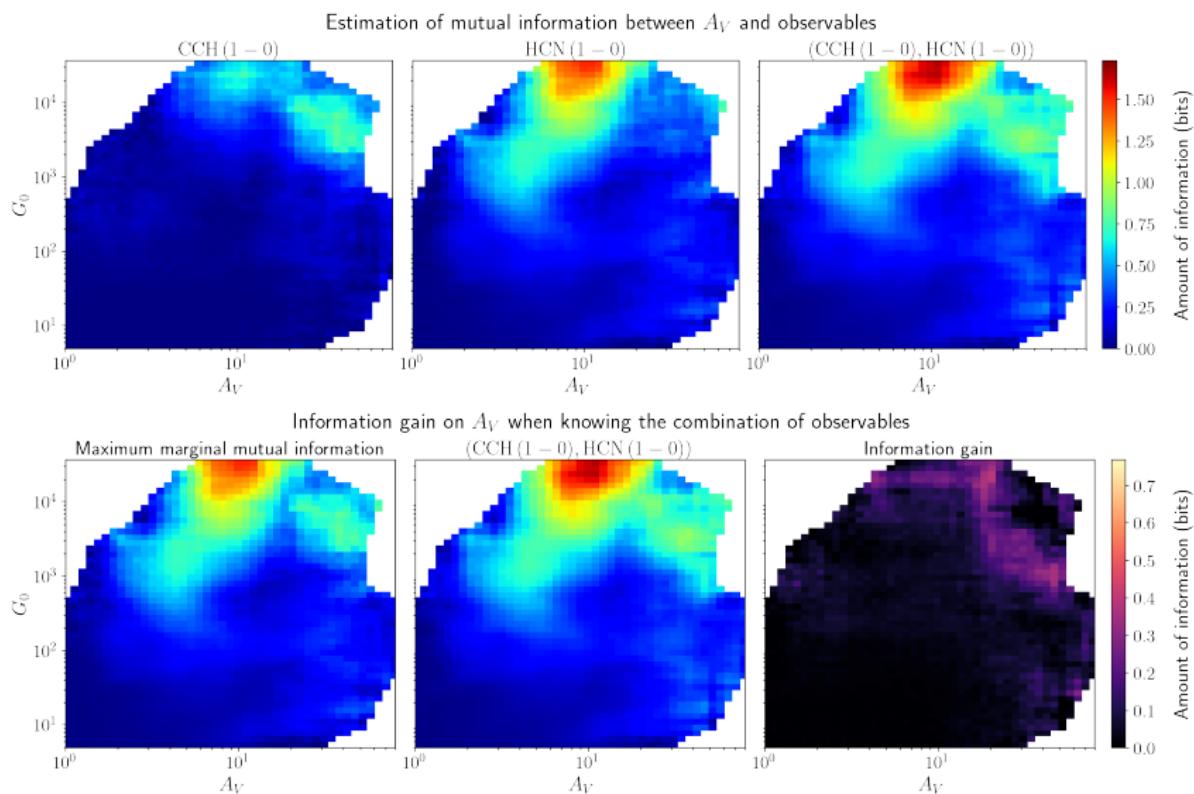
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{HCN} (1 - 0))$



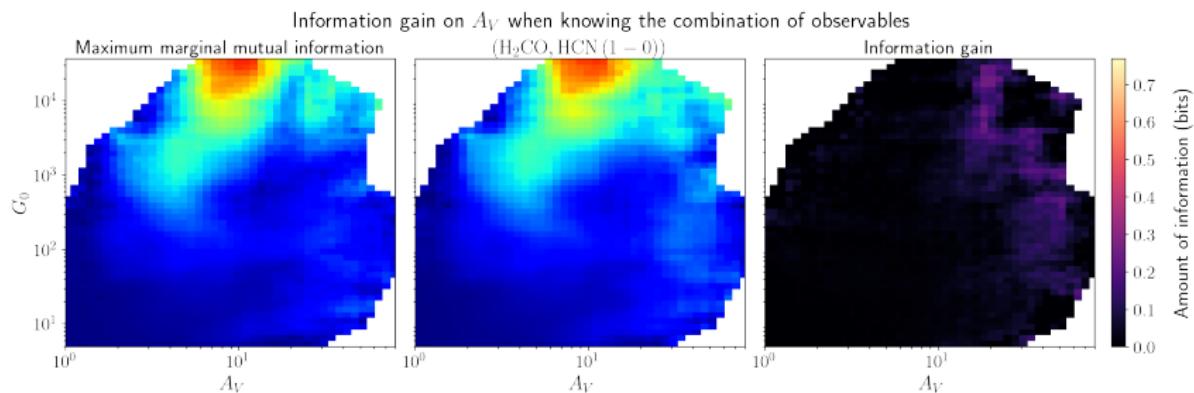
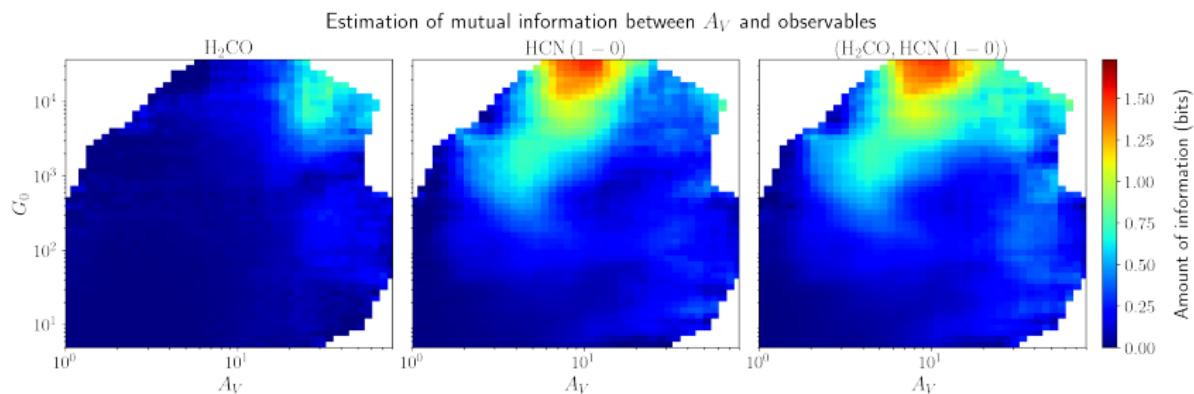
Informativity on A_V of $(C^{18}O(1 - 0), HCN(1 - 0))$



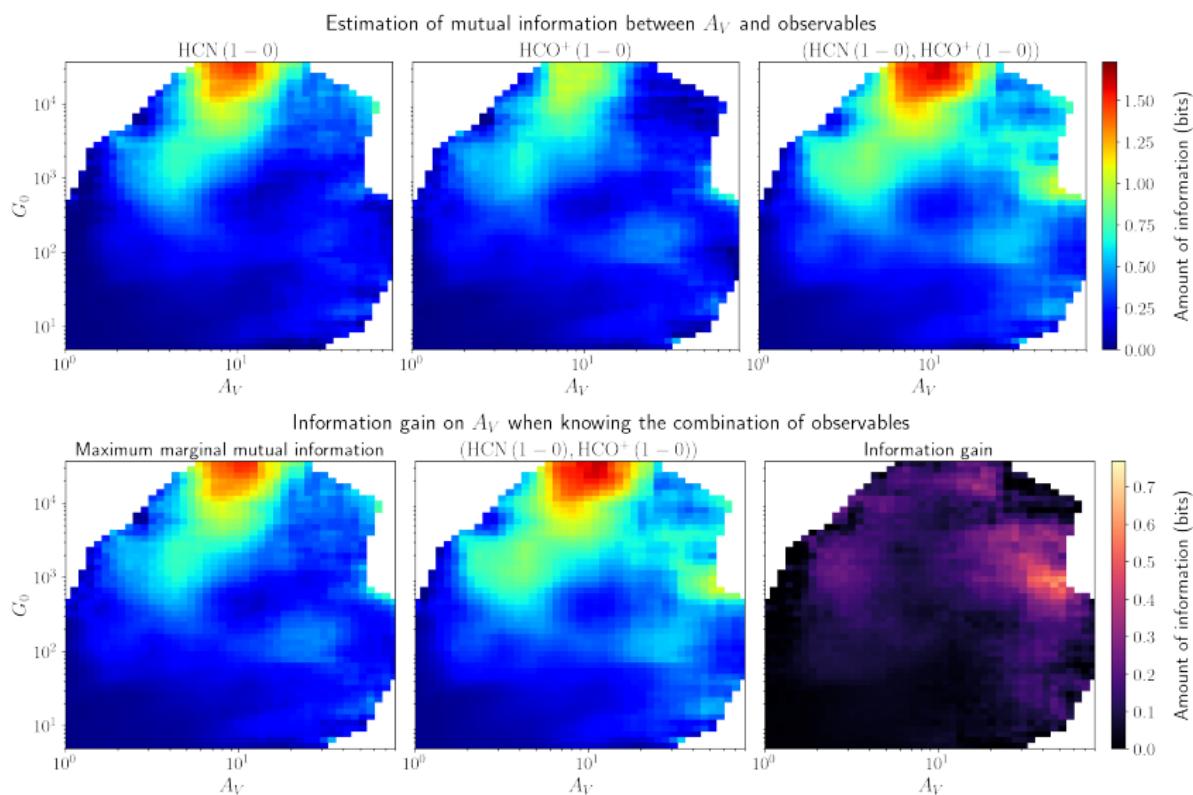
Informativity on A_V of (CCH (1 - 0), HCN (1 - 0))



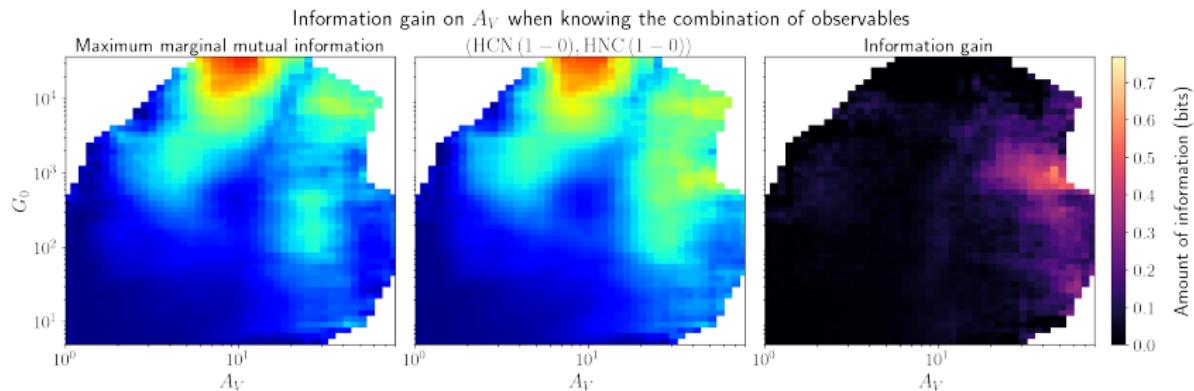
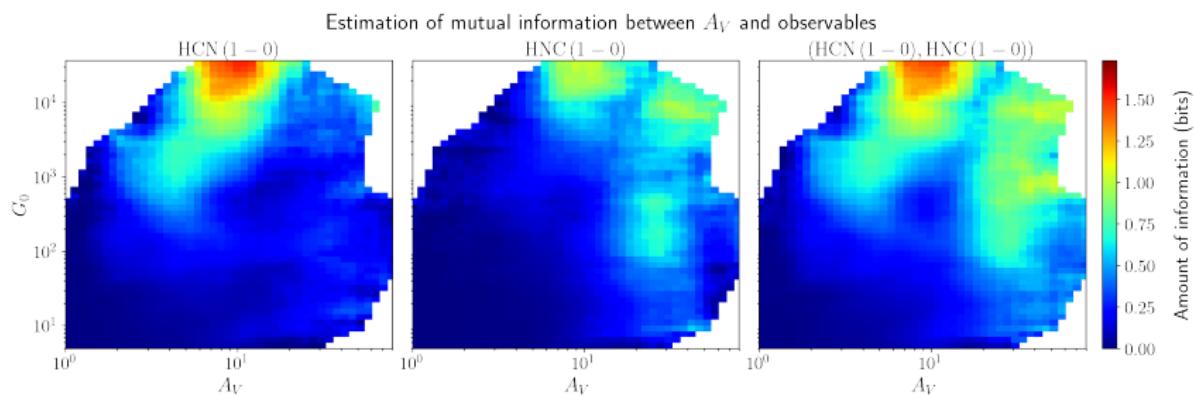
Informativity on A_V of (H_2CO , $\text{HCN} (1 - 0)$)



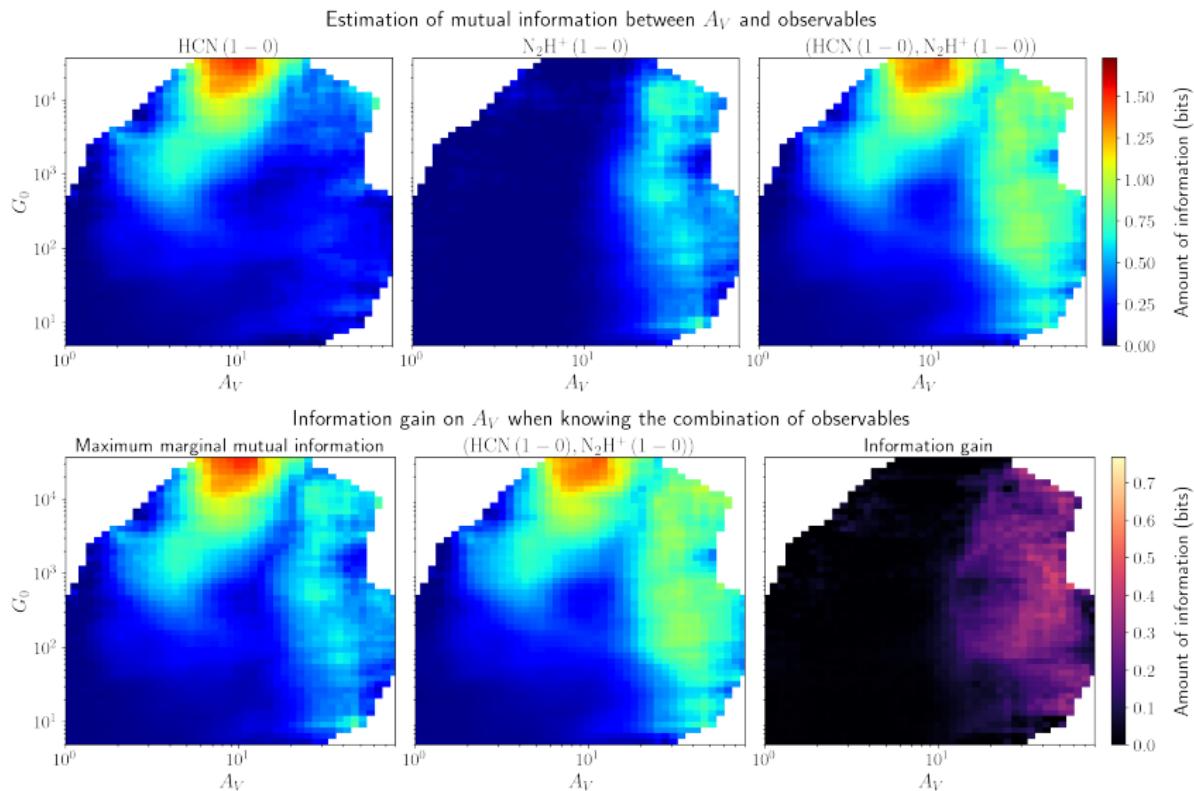
Informativity on A_V of (HCN (1 – 0), HCO $^+$ (1 – 0))



Informativity on A_V of (HCN (1 - 0), HNC (1 - 0))



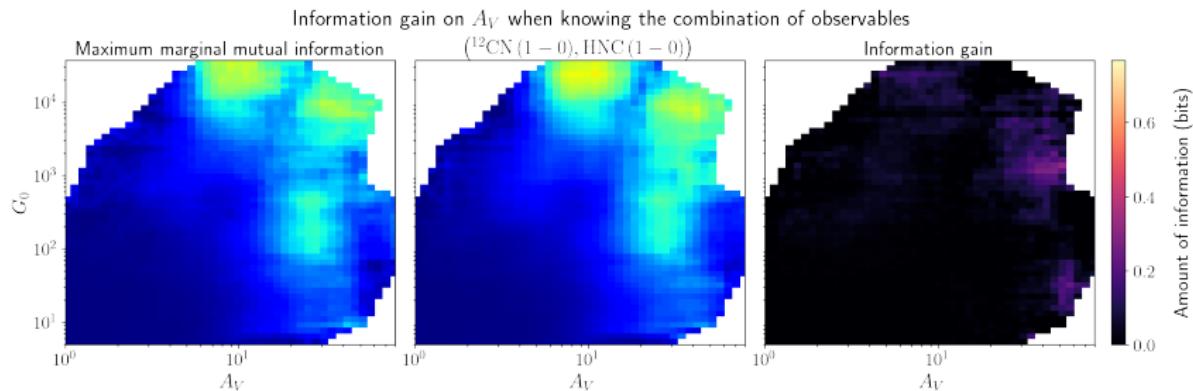
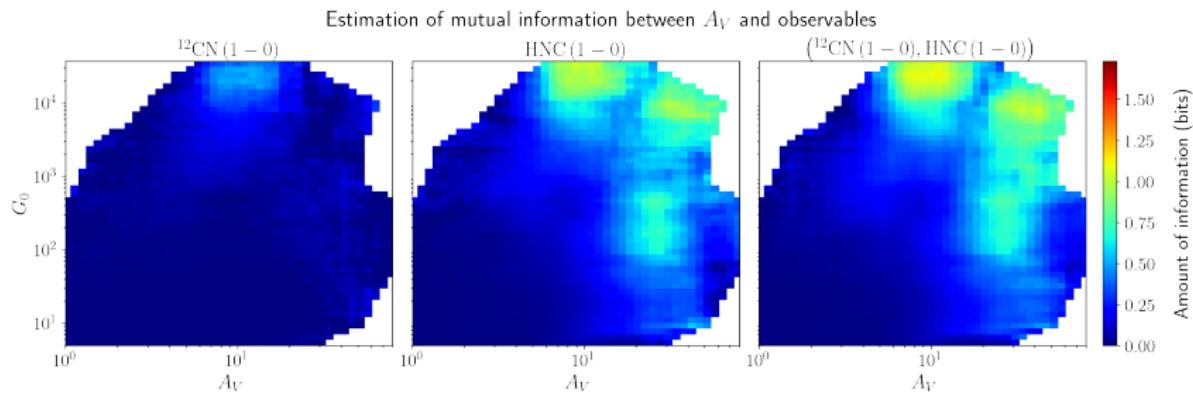
Informativity on A_V of $(\text{HCN} (1 - 0), \text{N}_2\text{H}^+ (1 - 0))$



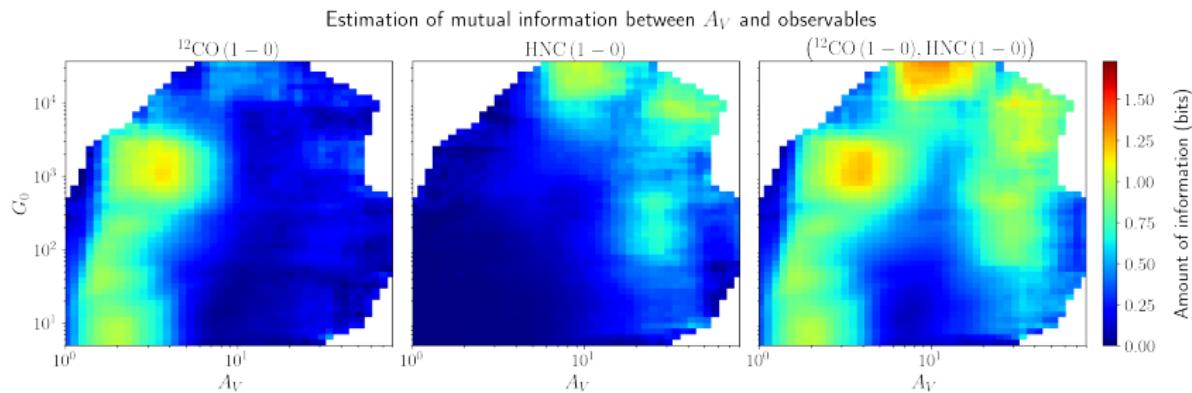
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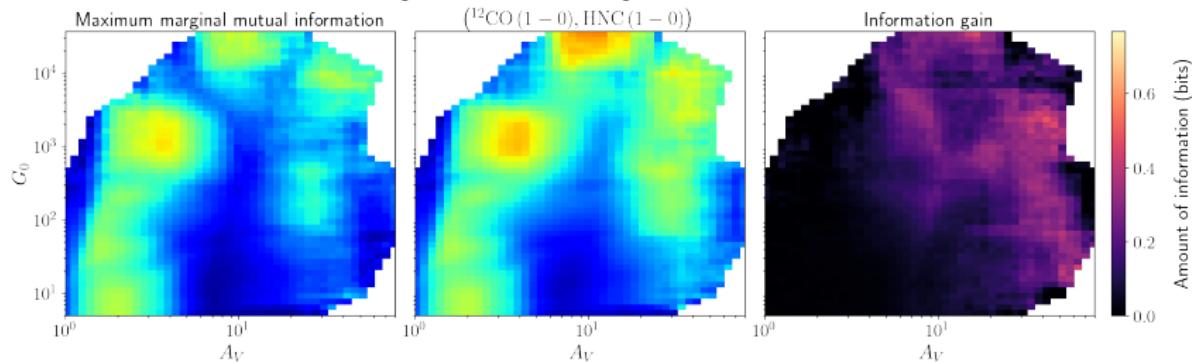
Informativity on A_V of $(^{12}\text{CN}(1 - 0), \text{HNC}(1 - 0))$



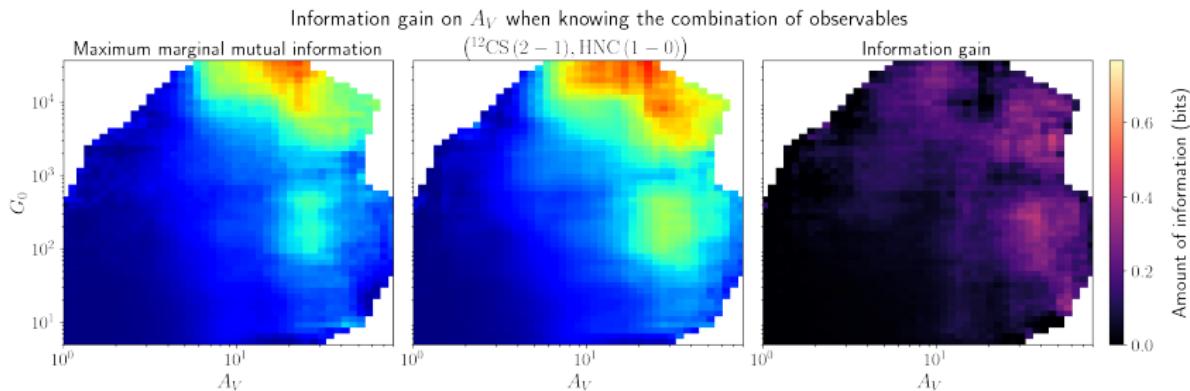
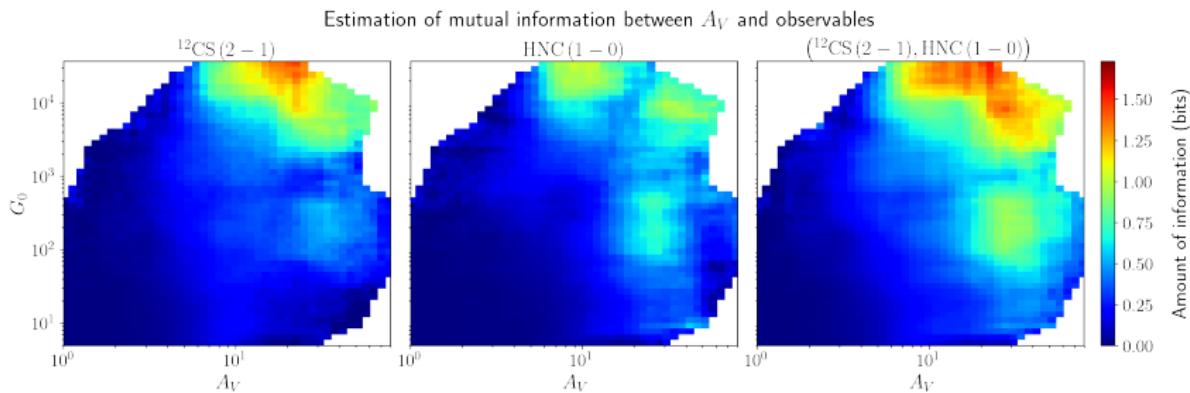
Informativity on A_V of $(^{12}\text{CO} (1 - 0), \text{HNC} (1 - 0))$



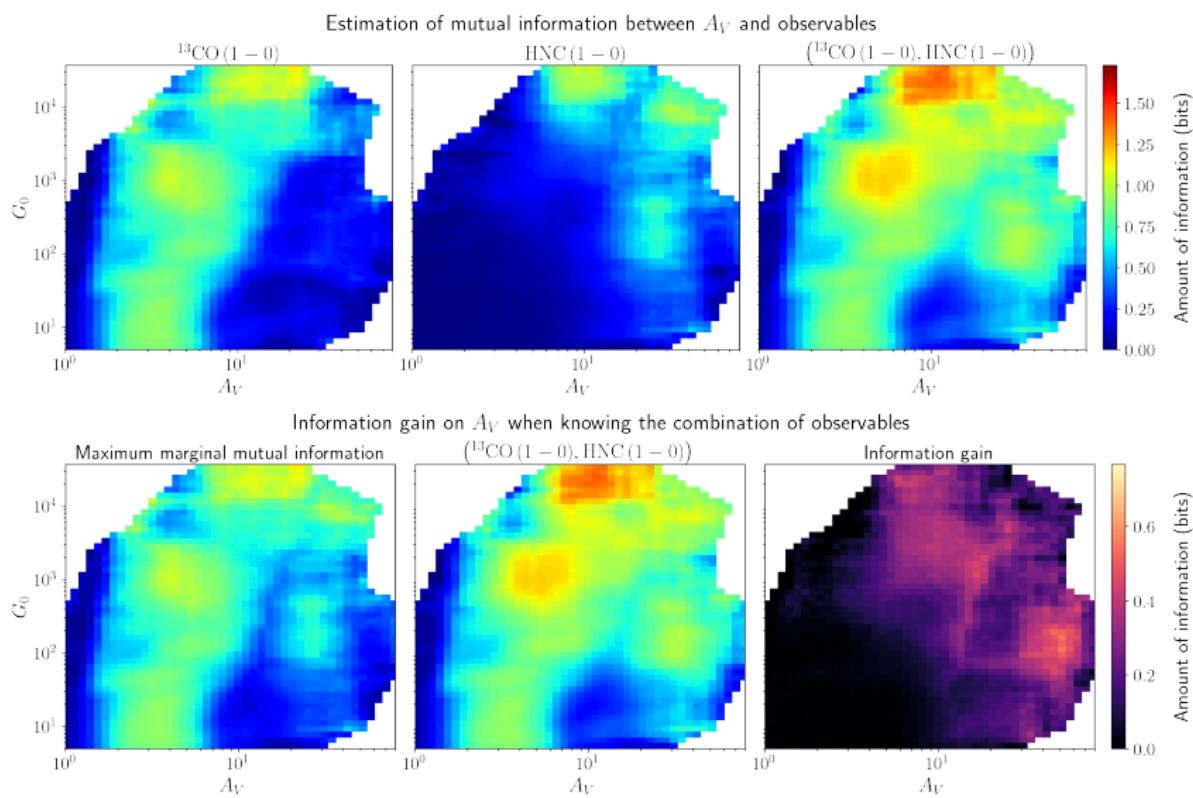
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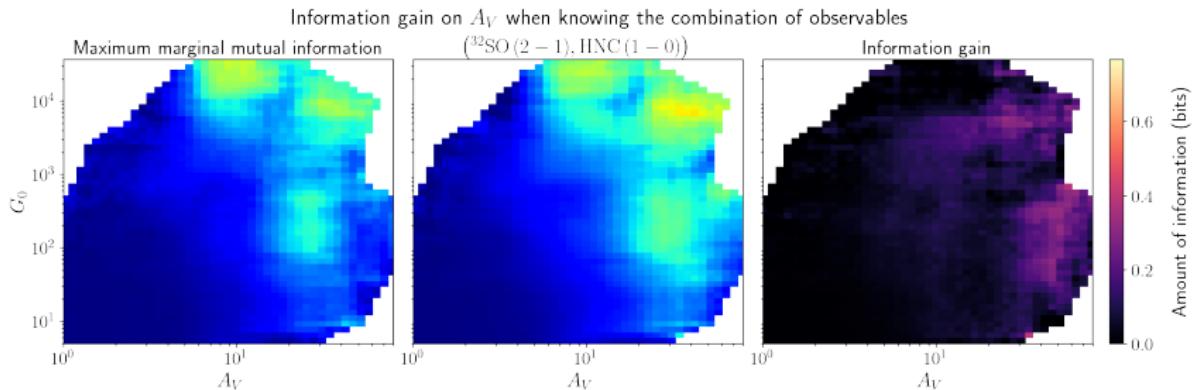
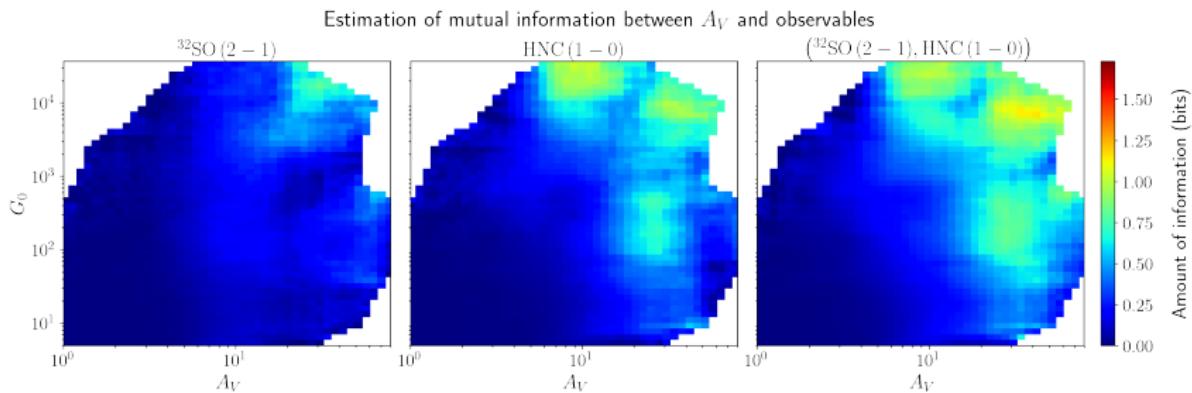
Informativity on A_V of $(^{12}\text{CS}(2 - 1), \text{HNC}(1 - 0))$



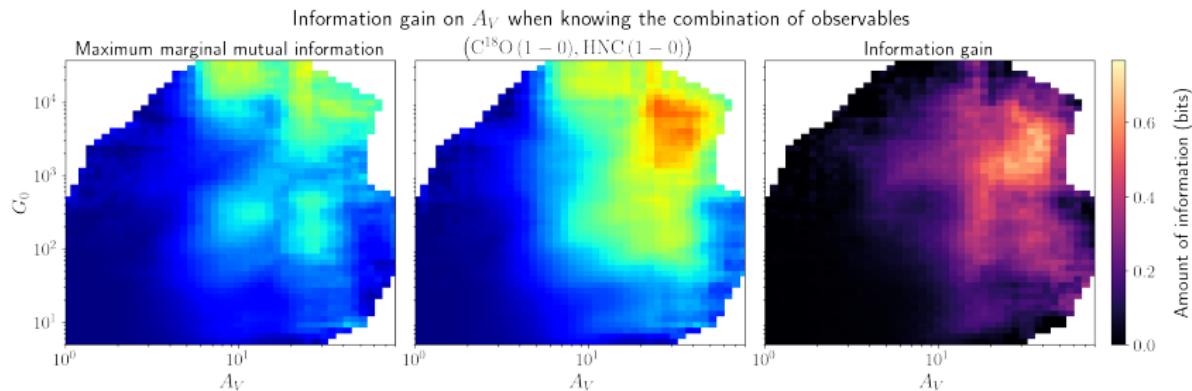
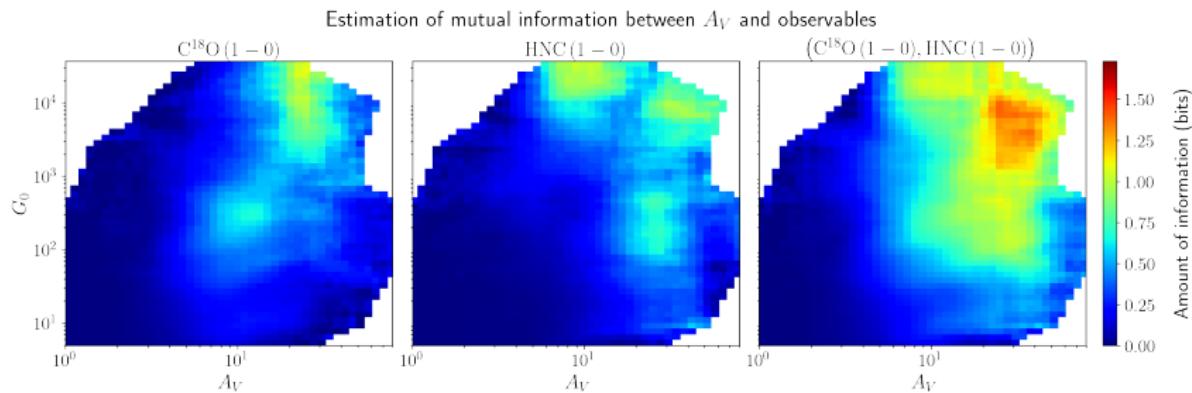
Informativity on A_V of $(^{13}\text{CO} (1 - 0), \text{HNC} (1 - 0))$



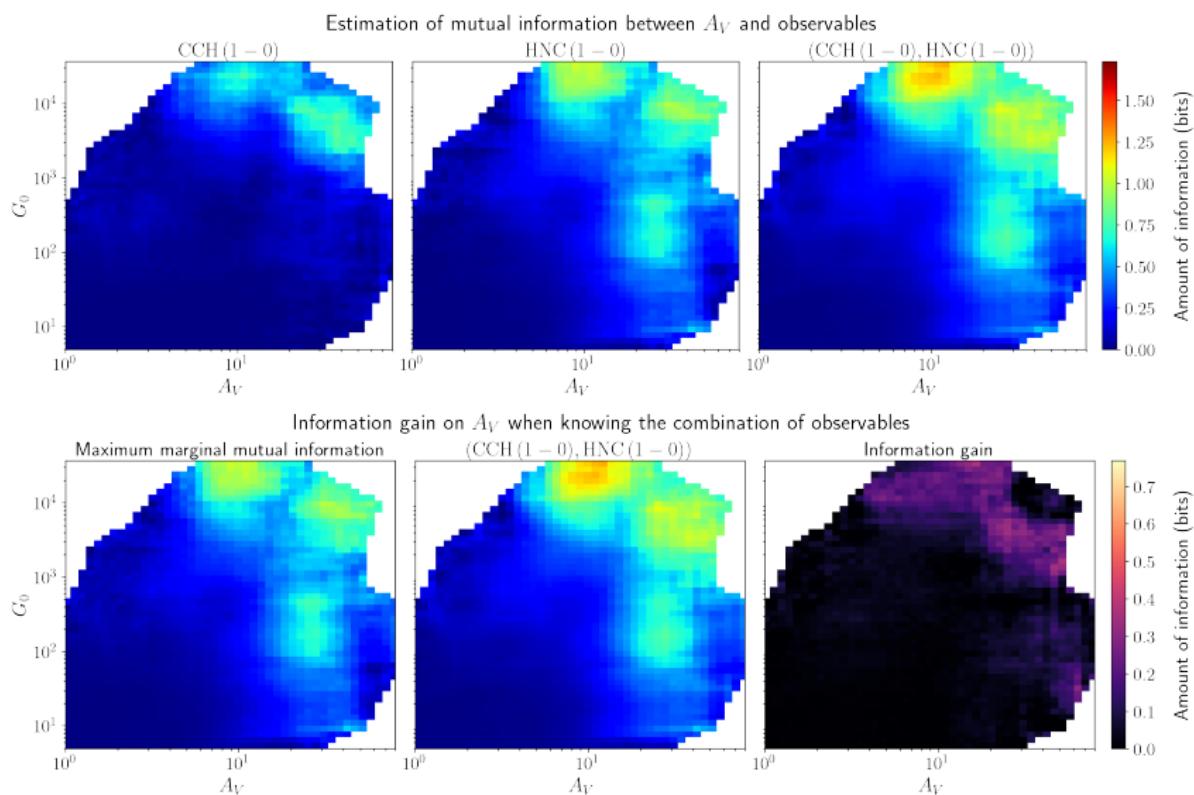
Informativity on A_V of $(^{32}\text{SO} (2 - 1), \text{HNC} (1 - 0))$



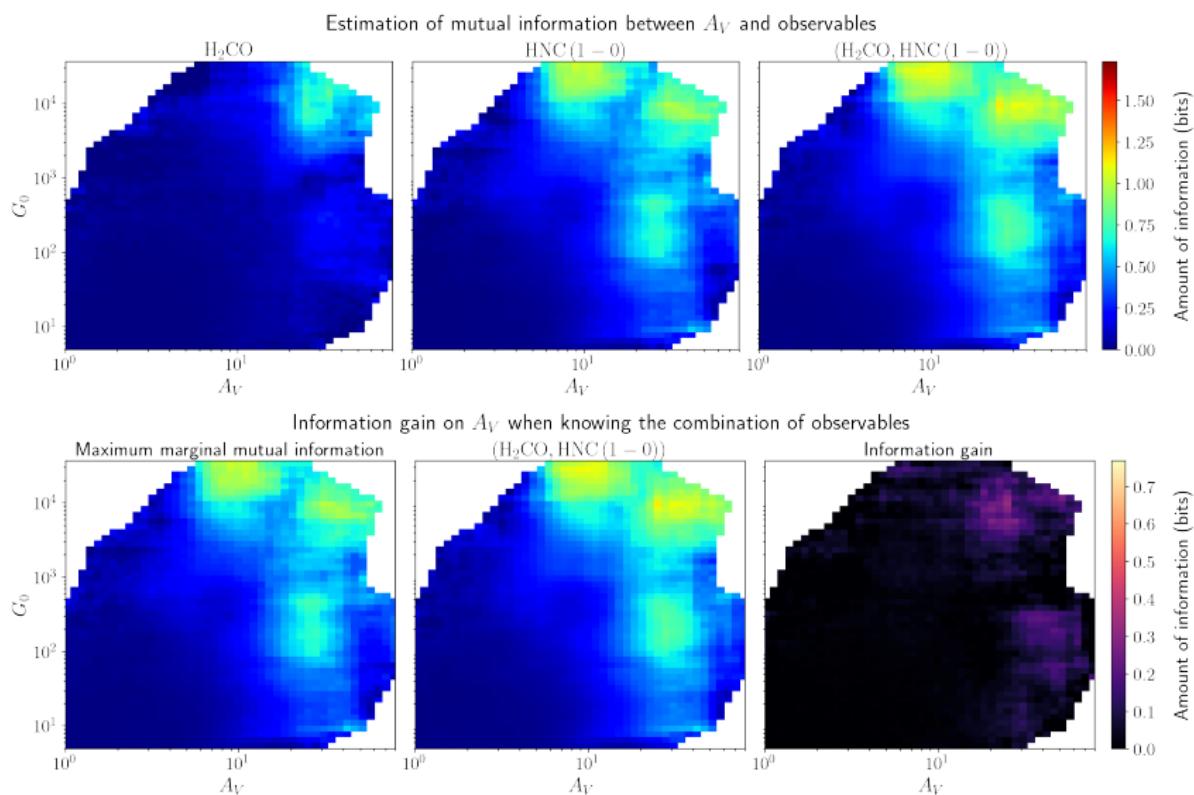
Informativity on A_V of $(C^{18}O(1-0), HNC(1-0))$



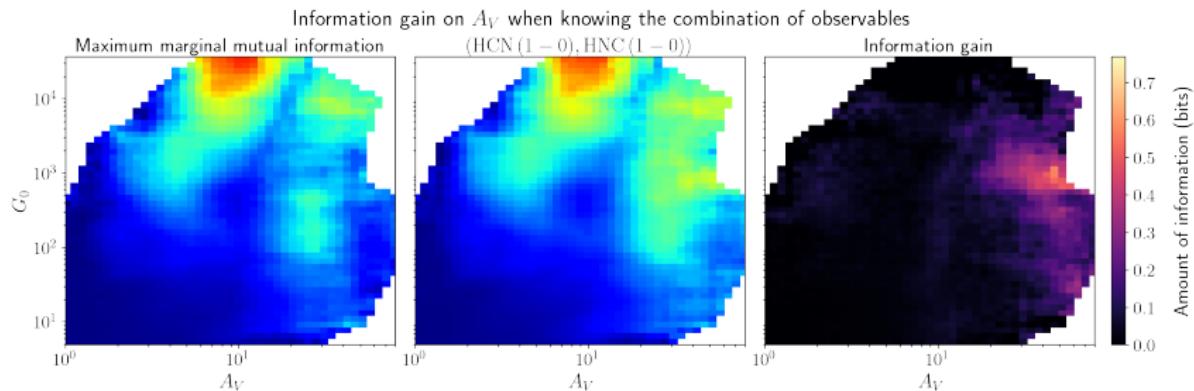
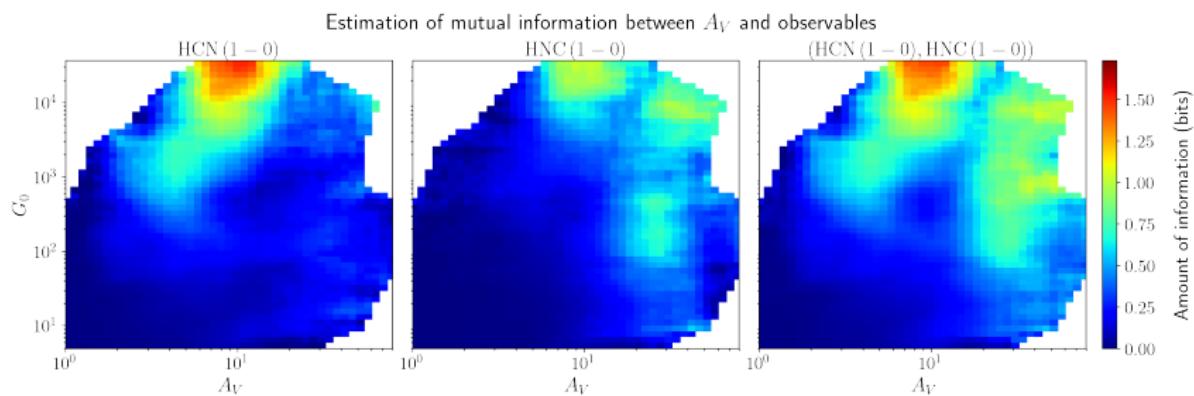
Informativity on A_V of (CCH(1 - 0), HNC(1 - 0))



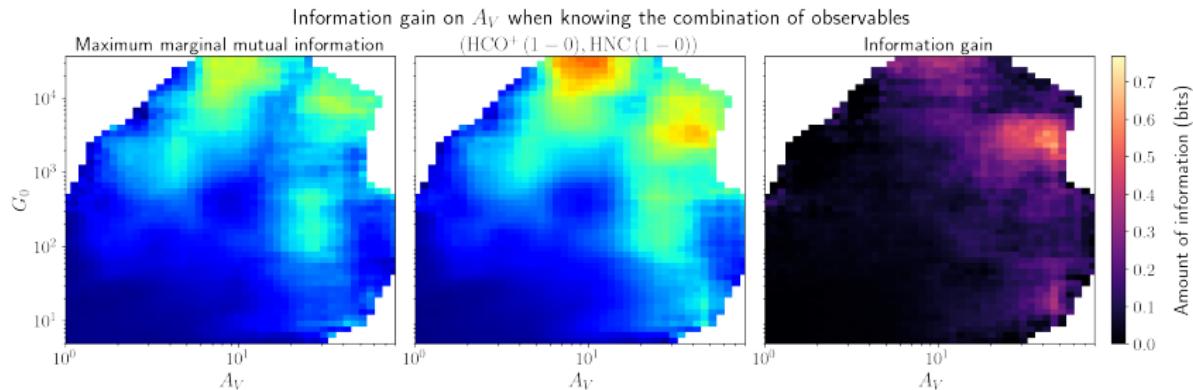
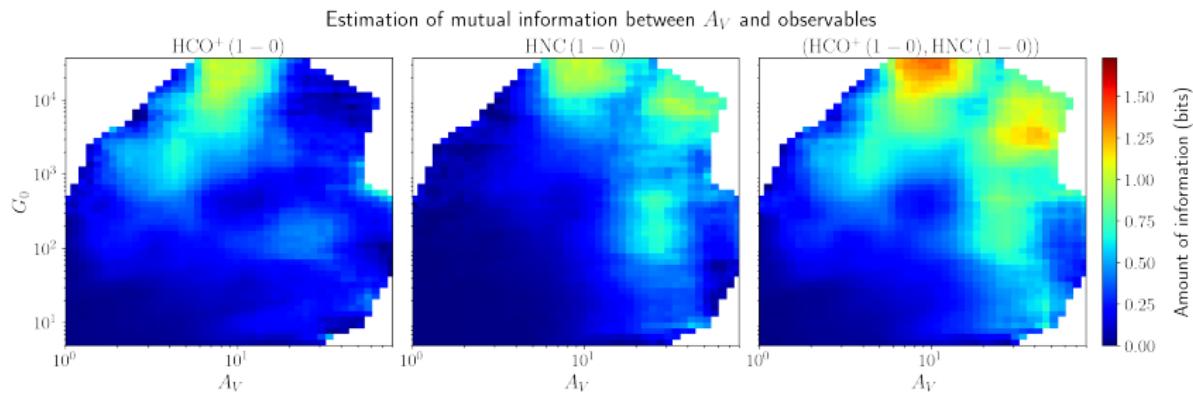
Informativity on A_V of (H_2CO , $\text{HNC}(1 - 0)$)



Informativity on A_V of (HCN (1 - 0), HNC (1 - 0))



Informativity on A_V of $(\text{HCO}^+ (1 - 0), \text{HNC} (1 - 0))$



Informativity on A_V of $(\text{HNC}(1 - 0), \text{N}_2\text{H}^+(1 - 0))$

