Ongoing projects in GENESIS

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High density regions

Classical photodissociation regions and shocks by stellar feedback (outflows, winds, radiation), HII regions

- [OI] 63 and 145 µm, [CII] 158 µm, [NII], high-J CO lines, *Herschel*, mm-data

  -> **S106, MonR2, M16, W43, Rosette (massive star-forming regions)**

  -> **Cygnus X pillars, globules and proplyds**

Low density regions:

WNM, CNM, low density PDRs, shocks (filament formation), molecular cloud formation (HI-H_2 transition), energy repartition, coupling of turbulence with heating and cooling

- [OI] 63, [CII] 158 µm, *Herschel*, (sub)mm-data, HI, CO

  -> Draco, Spider, Musca, IVCs

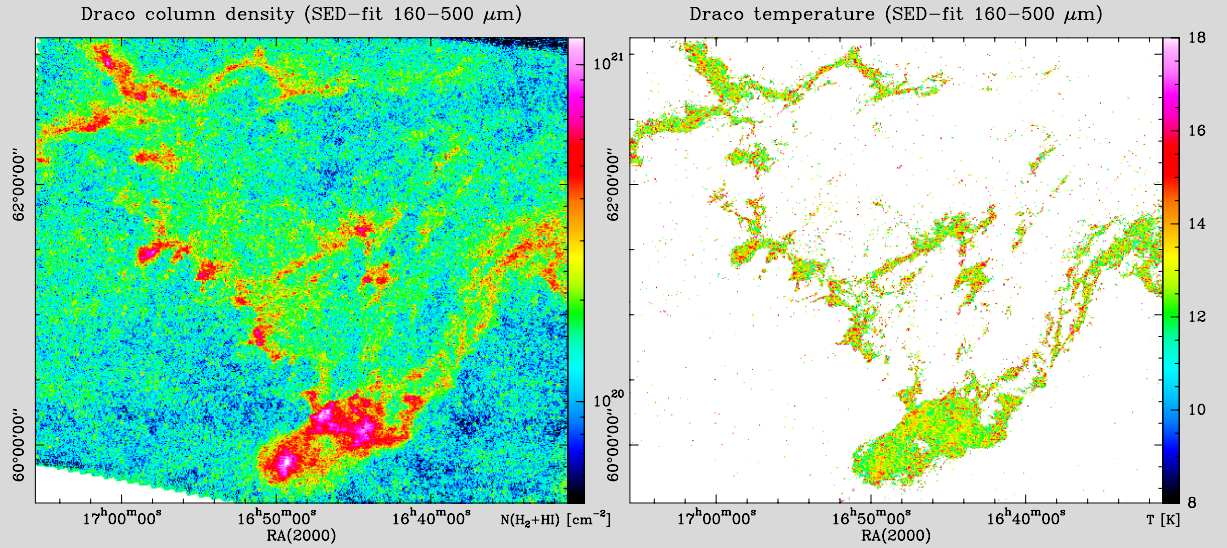
WNM, CNM, low density PDRs, molecular cloud formation (HI-H_2 transition), energy repartition, coupling of turbulence with heating and cooling

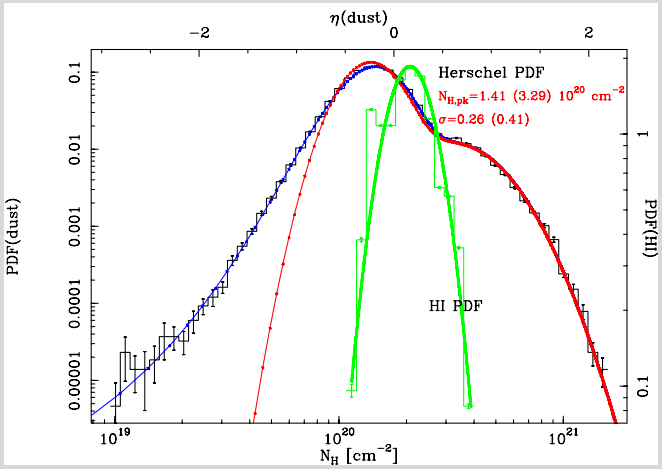
- [OI] 63, [CII] 158 µm, *Herschel*, (sub)mm-data, HI, CO

-> Draco, Spider, IVCs ***Collaboration Cologne, LAB, INRIA, Bonn, IAP***

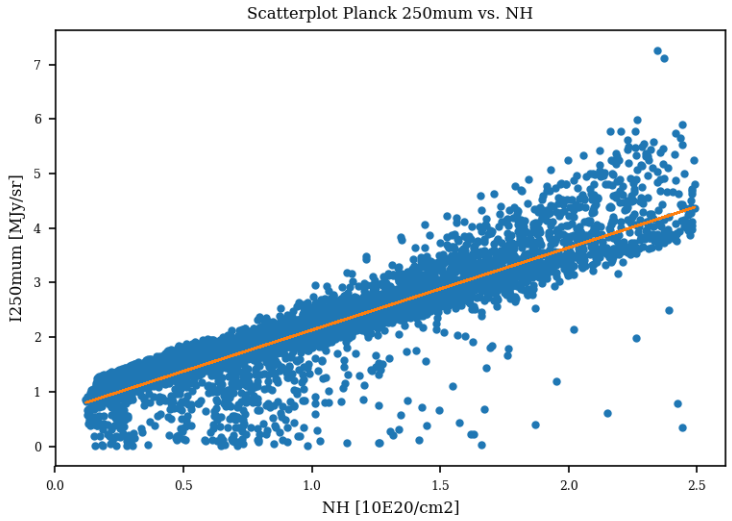
Major problem: producing a reliable column density map from *Herschel* data !

Standard approach: SED fit with a constant LOS temperature, T=const. where a fit is not possible (for Draco T=13 K).



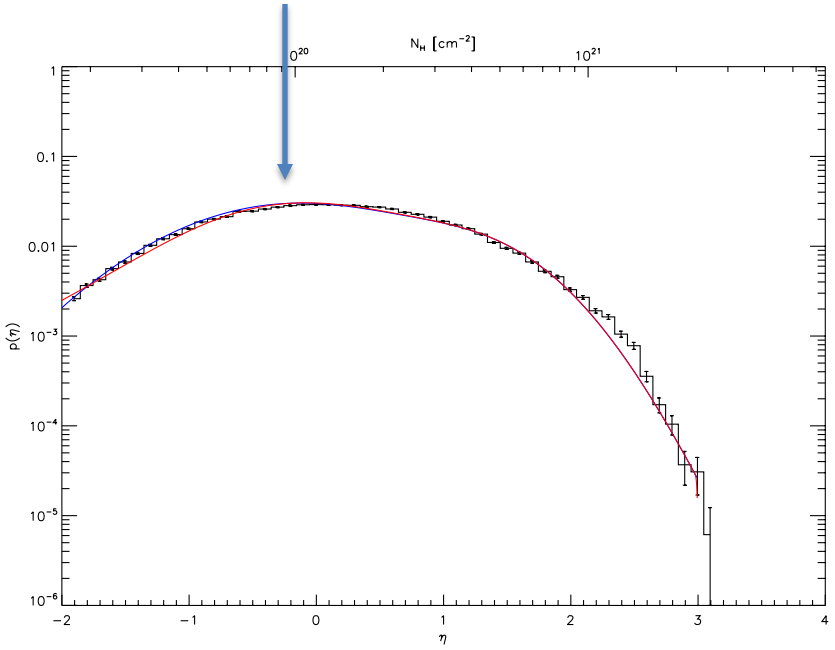


New approach: fitting Herschel fluxes against NH



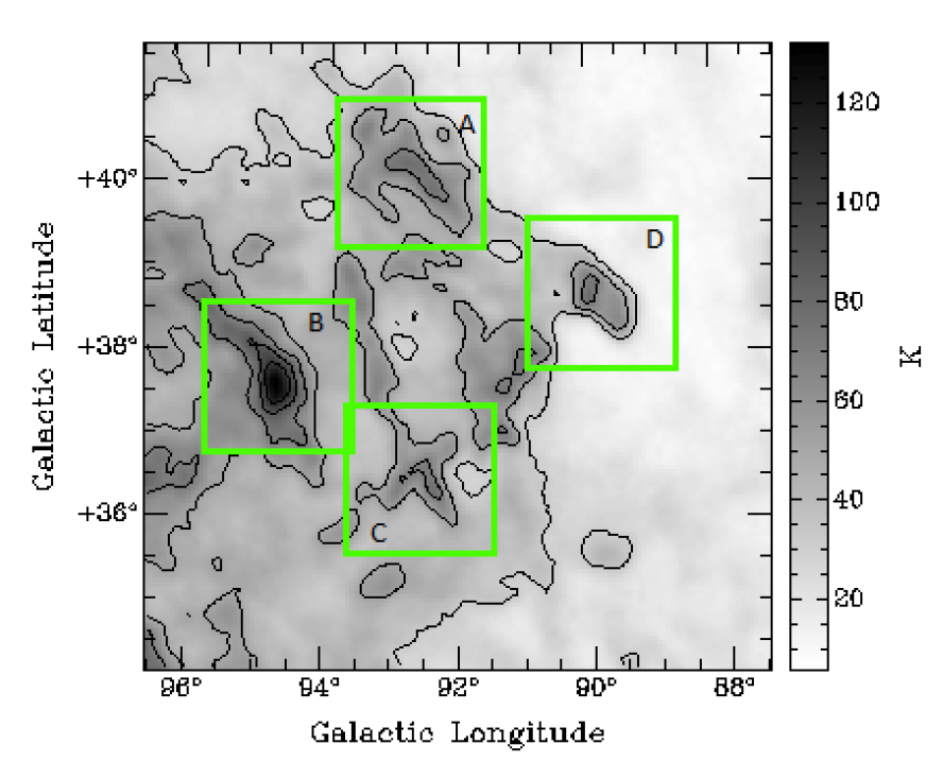
This N-PDF does not show a clear double-lognormal, but it can also only be fitted with two lognormals.

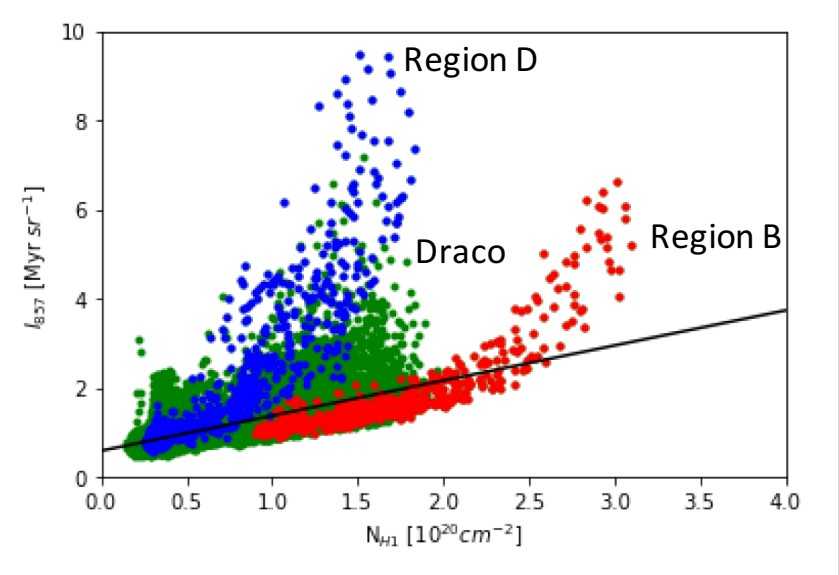
Transistion between NH = 1-2 10^{20} cm^{-2}



Planck flux against NHI shows a departure around NHI=1.5 – 2.5 $10^{20}cm^{-2}$
-> indenpendet confirmation for the HI/H_2 transition

HI temperature (Kuttner, Kerp et al.)





What are the turbulence properties of the gas, WNM, CNM, H_2 ?

How is structure (generation) linked to turbulence ?

How can the CII emission be explained ?