

## Questions and Answers

The Formation of Stars and Planetary Systems, 2010, September 6-9, Särö, Sweden

Section & Talk by C. Codella

Name/Question L. Kristensen

Did you try to estimate the amount of gas warm enough to drive all D into H<sub>2</sub>O?

C. CODELLA:

No, Given we have analysed so far only one H<sub>2</sub>O line as observed by HIFI, we just used some physical characteristics as derived from CO to give a first very rough estimate of H<sub>2</sub>O abundances. In particular the uncertainty on

Name/Answer

filling factors is very high.

We are confident to perform a careful analysis of H<sub>2</sub>O towards L187-B1 once reduced all the HIFI and PACS spectra we are collecting. Then, we will have in our hands a large number of lines as well as estimates of the size of the H<sub>2</sub>O source.

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Name/Question ..... R. Crisp .....

The  $H_2O$  profile extends to larger velocities than those of any other molecule.

The profile = intensity distribution with frequency is a mapping of the line source function dependence on the opacity - so,  $H_2O$ - $\tau$  is large, hence the line is wide. The meaning of the Gaussian v-components are not readily understandable.

Name/Answer .....

The analysis of the  $H_2O$  emission is very crude (see also the answer to the L. Kristiansen's question). For a careful study we need to fit a large set of lines as well as to better know filling factors (now based on the assumption that  $SiO$  and  $H_2O$  are tracing the same region, at least at the highest velocities). This information will be provided by the already collected HIFI & PACS spectra.

However, for the present L1157-B1 core, where we are tracing a clumpy bow structure created by a precessing jet, and where such clumps are ~~observed~~ ~~expected~~ to be associated with different chemical and physical conditions, it is reasonable to expect that chemistry and physics depend on velocity (i.e. other words on which portion of the shock we are observing at a given velocity).

CONTINUE

Opacity is of course a key-parameter for the  
tho analysis, but we cannot have a  
proper measurement with just one line.  
However, note that the  $\text{NH}_3/\text{H}_2\text{O}$   
intensity ratio we discuss has been  
observed for the  $\beta$ -coldest  $\text{MV}$  sample,  
with velocities up to  $|V - V_{\text{sys}}| \sim 8 \text{ km/s}$ ,  
(where  $\epsilon$  could play a 'minor' role).