Outflows parameters

CO J=6-5

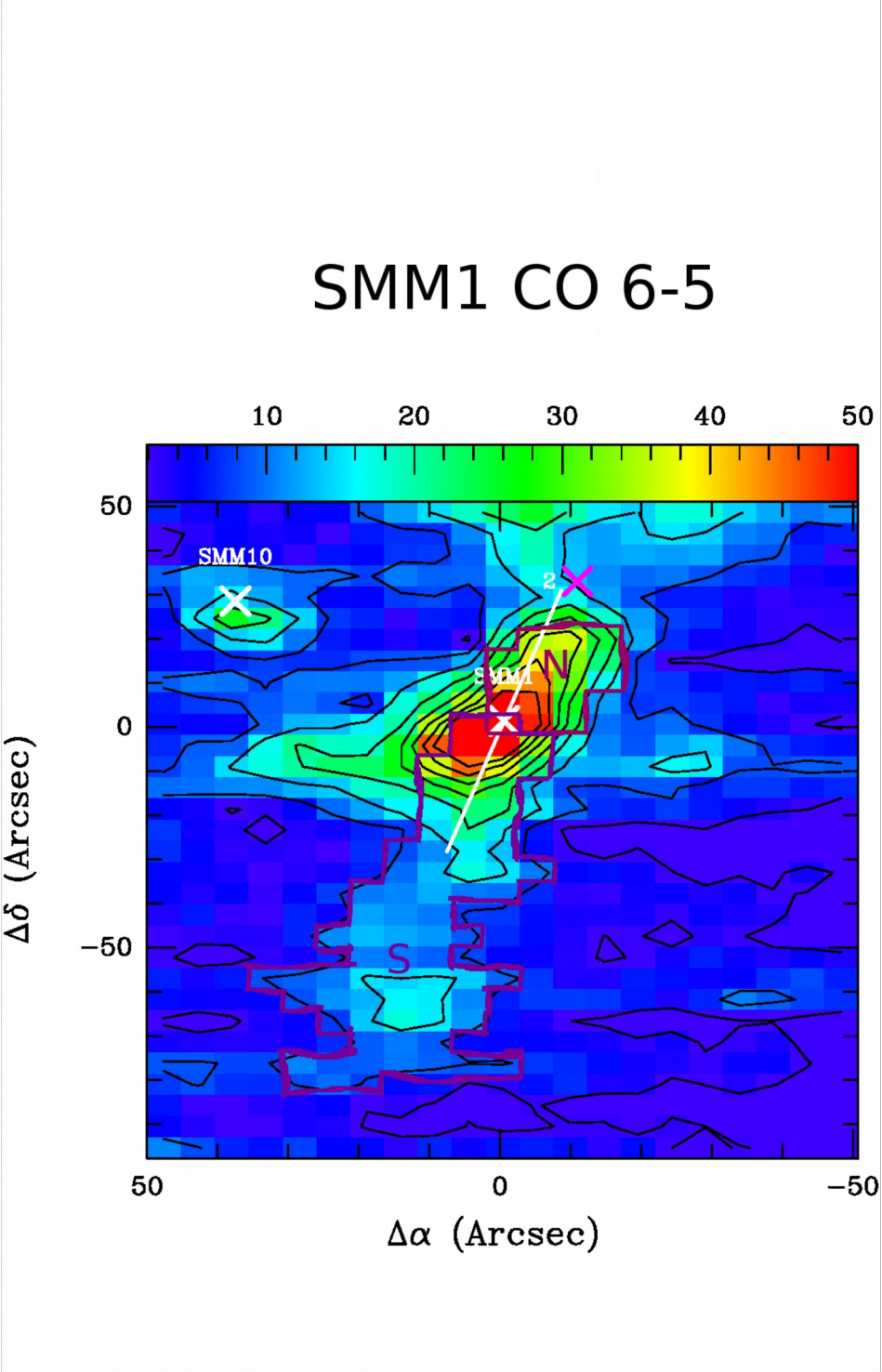

Fig. 1. Ser-SMM1 map in CO 6-5. Blue outflow was divided into two parts: Northern and Southern. Pixels used for outflow parameters calculation are marked with dark and bright purple respectively.

Region	SMM1 North	SMM1 South	Yildiz et al. 2015
Number of pixels	23	74	
M_outfllow [M_sun]	2.89e-3	7.47e-3 sum: 1.04e-2	1.6e-2
R [AU]	7,589	27,990	34,000
t_dyn [yr]	718	2,648	8,400
M_dot [M_sun/yr]	4.02e-06	2.82e-06	8.2e-06
F_outflow [M_sun/yr km/s]	1.01e-02	7.07e-03	1.5e-04

There is one order of magnitude difference between calculated outflow mass (M_outflow) and published by Yildiz et al. 2015. It may be caused by:
- different distance to the source: I assumed 260 pcs (Evans et al. 2009)
- different integration method: I used rectangular method
- different size (area) of the outflow: I calculated the fluxes from pixels marked in Fig. 1.

HCN J=1-0

Region	SMM1 North	SMM1 South
Number of pixels	5	8
M_outfllow [M_sun]	175.54268	298.97825
R [AU]	8,222	15,817
t_dyn [yr]	9,506	18,288
M_dot [M_sun/yr]	1.8e-02	1.6e-02
F_outflow [M_sun/yr km/s]	3.7	3.4

For outflow mass calculation we need relative abundances [H2/HCN]. I applied 10e9 from Hirota et al. 1998 and it seems to be a reasonable value. But this factor effects the outflow mass very much. According to this equation (Yildiz et al. 2015, eq. 3):

$$M_{\mathrm{outflow}} = \mu_{\mathrm{H_2}}\, m_{\mathrm{H}}\, A \left[\frac{\mathrm{H_2}}{^{12}\mathrm{CO}}\right] \sum_j N_{\mathrm{total},j}$$

A few order of magnitudes higher H2/molecule ratio (comparing to 10e4 for H2/CO) gives suspiciously high outflow mass in HCN (despite of lower column densities). Do you have any suggestions what could went wrong?

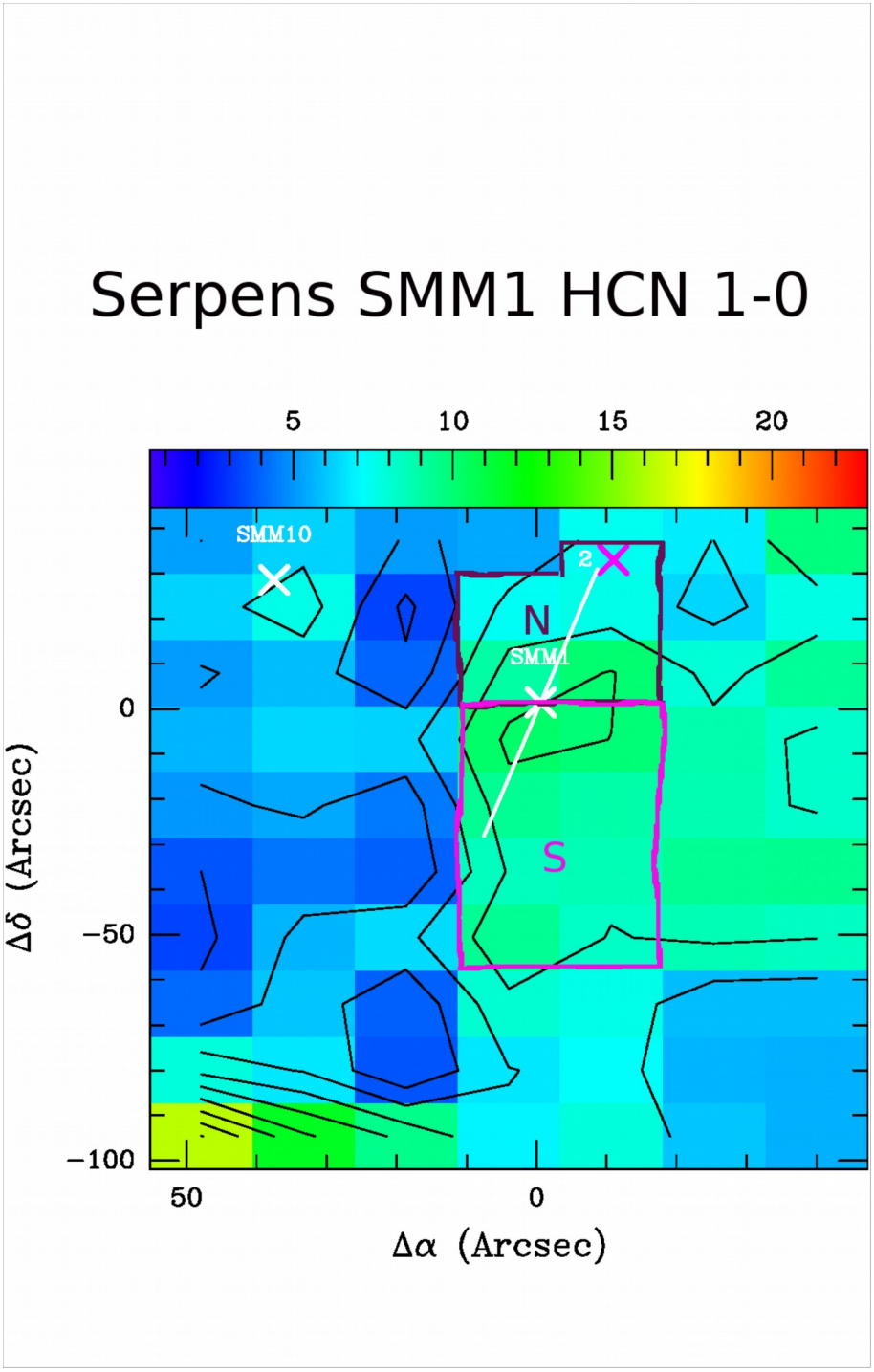

Fig. 1. Ser-SMM1 map in HCN 1-0. Blue outflow was divided into two parts: Northern and Southern. Pixels used for outflow parameters calculation are marked with dark and bright purple respectively.