ACCRETION IN THE STAR FORMING REGION σ ORIONIS.

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σ Ori is a star forming region at a distance of 350 pc, with age $\sim$3 Myr. Recently $\sim$340 sources have been observed in the Mid InfraRed with *Spitzer* space telescope (Hernandez et al. 2007), roughly 100 of them have been classified as Class II (i.e., objects with optically thick disks). This Class members distribution and extimated age of the cluster make σ Ori an ideal star forming region where to study more advanced phases of accretion phenomena in low mass stars.

We present a determination of the mass accretion rate based on observations of hydrogen Infrared lines Paschenβ and Paschenγ, based on J band medium resolution spectroscopy, obtained with SOFI-NTT. Our sample of 35 targets with J<14.5, ranging in mass between $\sim$0.1 M$_\odot$ and $\sim$0.8 M$_\odot$, has been selected for the presence of a K-L' color excess; The comparison with the *Spitzer* observations shows that $\sim$70% of stars of our sample are Class II objects (classical T Tauri stars); The Class II sample is distribuited in the H-[8μm] and K-[24μm] color indexes as the *Spitzer* complete sample (Fig.1 and Fig.2). We detect accretion in about 1/2 of the sample of Class II objects as shown in Fig.3, where the results for σ Ori are compared with results in other star forming regions of different ages, in $\dot{M}_{acc}$ vs. M$_*$ plots.
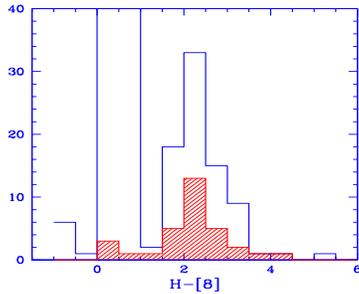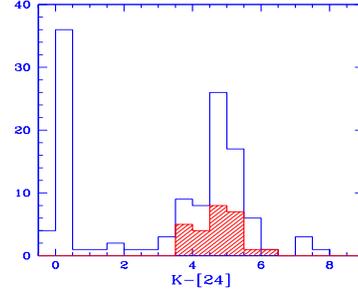

Figure 2: Distribution of our sample (red shedow), superimposed to all σ Ori members observed by Hernandez et al. 2007, versus K-[24μm] color index.

Figure 1: Distribution of our sample (red shedow), superimposed to all σ Ori members observed by Hernandez et al. 2007, versus H-[8μm] color index.
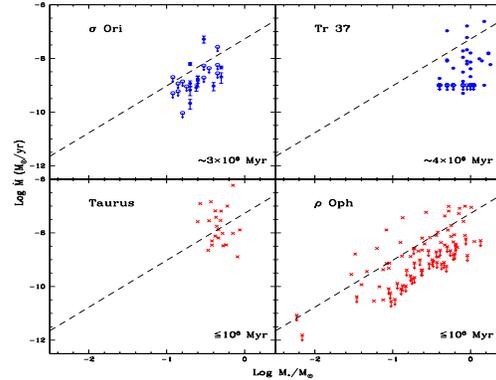

Figure 3: Comparison of $\dot{M}_{acc}$ vs M$_*$ plots between different Star Forming Regions of different ages. Top left pannel: σ Orionis, $\sim 3 \times 10^6$ Myr; Top right pannel, Tr 37, $\sim 4 \times 10^6$ Myr; Bottom left pannel: Taurus, $\leq 10^6$ Myr; Bottom right pannel: ρ Ophiuchus, $\leq 10^6$ Myr. In red symbols pannels, crosses are detections, crosses with arrows are upper limits; In blue symbols pannels, filled circles are detections, empty circles with arrows are upper limits. The dashed line shows the relation $\dot{M}_{acc} \propto M^{1.8}$.

References

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