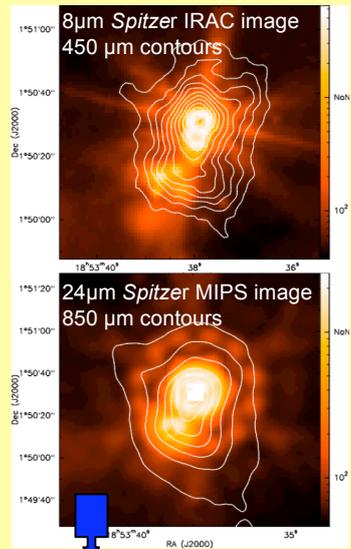
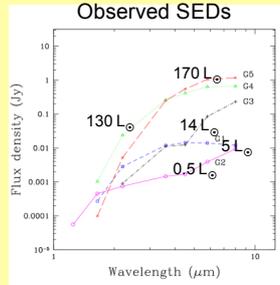
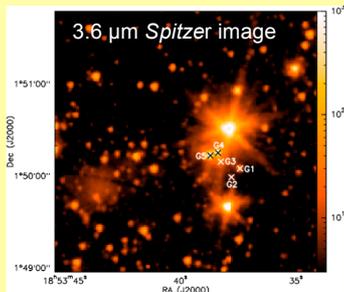
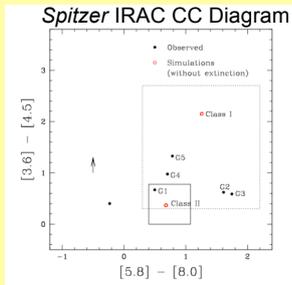


IRAS 18511+0146: A proto Herbig Ae/Be cluster?

S.Vig¹, L. Testi^{1,2}, M. Walmsley¹, S. Molinari³, S. Carey⁴, A. Noriega-Crespo⁴

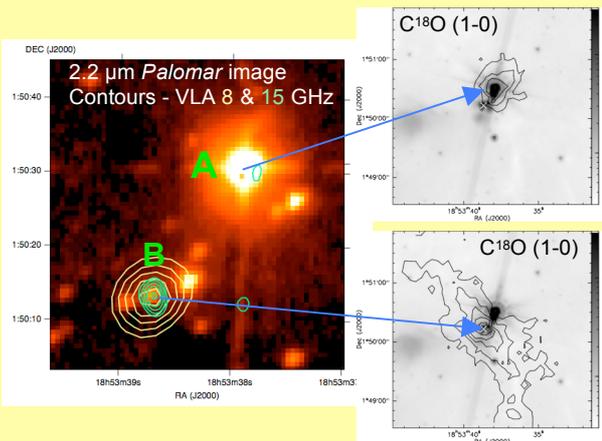
¹Osservatorio Astrofisico di Arcetri, Firenze, Italy, ²ESO, Garching, Germany, ³Istituto di Fisica dello Spazio Interplanetario, Roma, Italy, ⁴Spitzer Science Centre, Caltech, USA

The evolution of a young protocluster depends on the relative spatial distribution and dynamics of both stars and gas. We study the distribution and properties of the gas and stars surrounding the luminous ($10^4 L_{\odot}$) protocluster IRAS 18511. We explore this cluster using infrared, submm and radio continuum data.



The central bright source (IRAS peak) is saturated in IRAC and MIPS 24 μm bands. IRAC 8 μm image shows double sources near peak. The sources G4 and G5 have been fitted with the YSO models of Robitaille et al and results indicate that they can be explained by massive ($7\text{-}10 M_{\odot}$) Class I and/or edge-on Class II sources.

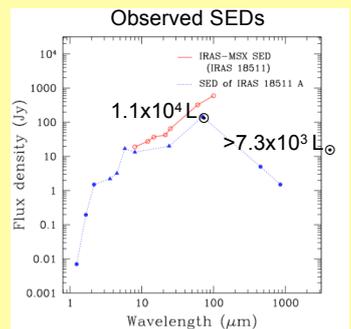
Temperature of core 37 ± 5 K
Total gas mass $750\text{-}1300 M_{\odot}$
(20-30K)
Maximum A_V at peak 86 mag



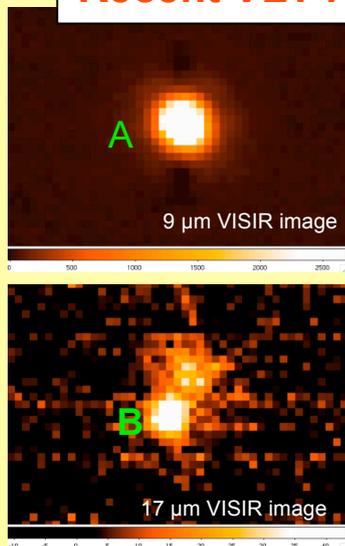
Evolutionary stages of A and B

A - no radio emission detected
- large IR emission; $\geq 7000 L_{\odot}$
B - radio ZAMS spectral type B0.5-B0

I A is in earlier evolutionary stage than B
II A has a more massive clump associated with it as compared to B.



Recent VLT results (July 2007)!!



Observations were carried out with VISIR on VLT, Paranal. The pixel scale of images is $0''.127$ pixel. Initial results suggest the following:
1. Mid infrared 8 μm emission shows that A is a single source (unlike the impression created by the saturated IRAC image.)
2. Diffuse emission is observed close to B!! The SED of this emission rises steeply with wavelength (upto 20 μm).

IRAS 18511+0146 is likely to be a precursor to a Herbig type star cluster based on the following considerations.

1. It is a small embedded cluster associated with a bright mid infrared source ($10^4 L_{\odot}$).
 2. Evolutionary stages of cluster members are Class I, Class II based on SEDs as well as from cluster simulations (for details contact S.Vig).
 3. Size of cluster is ~ 0.6 pc (submm emission from cloud).
 4. Total number of cluster members from simulations ~ 200 ($>0.2 M_{\odot}$).
- Therefore, IRAS 18511 is a fore-runner of clusters associated with Herbig objects similar to those studied by Testi et al. (1998, 1999).

S. Vig et al., 2007, A&A, 470, 977