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MID-IR IMAGING OF THE BN/KL REGION

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Although the BN/KL region is one of the most active star forming sites in the solar vicinity, its true nature is still poorly understood. Due to the large foreground extinction, high-resolution IR studies are needed to obtain some hint on the location and nature of the energy source(s) of the region. In this paper we present a new high-resolution 10 μm image of the BN/KL region obtained on UKIRT in diffraction limited conditions.

During a project aimed to the mapping of the entire Orion Nebula in the N filter, we have obtained the image presented in Fig. 1. This is a composition of several frames taken with the MPIA mid-IR camera MAX (Robberto and Herbst 1998) in Oct 1997 and Nov 1998. To recover the effects of chopping in a crowded field, we used an algorithm developed by our team (Bertero, Boccacci and Robberto, 2000). Our image shows the BN/KL region with unprecedented resolution and sensitivity at this wavelength.

The most intriguing source of the nebula is the IRc2 region which, in Fig. 1, shows an extended emission with a roughly triangular shape. Accounting for the larger diffraction limit at 10 μm, one can recognize the three sources (IRc2 A, B and D) previously observed in the near-IR (Chelli et al. 1984, Dougados et al. 1993). The bright, unresolved source $\sim 2''$ S of IRc7 corresponds to source "n" of Lonsdale (1982) and to the radio source "L" of Menten and Reid (1995).

IRc2 has been considered for many years as the main luminosity source of the BN/KL region. Recently, Gezari et al. (1998) obtained a luminosity of only about 10^3 $L_\odot$, and therefore questioned the contribution of IRc2 to the total luminosity of the complex. However, the color temperatures of extended and barely resolved sources behind large amounts of extinction must be regarded with great caution, because the color dependence of the extinction may easily affect the filling factors at different wavelengths. While we resolve the sources IRc2 A, B, C and D, the radio source I (Churchwell et al. 1987) remains invisible at 10 μm. A hypothesis is that source I is the real high luminosity source, embedded at the center of an elongated ridge. The IRc2 complex could therefore be the result of density fluctuations at the edge of the ridge rather than real point sources. In fact, we may be observing a thick circumstellar toroid in which the northern side faces the observer. To prove this hypothesis we have recently collected a number of narrow band images that we shall discuss elsewhere.

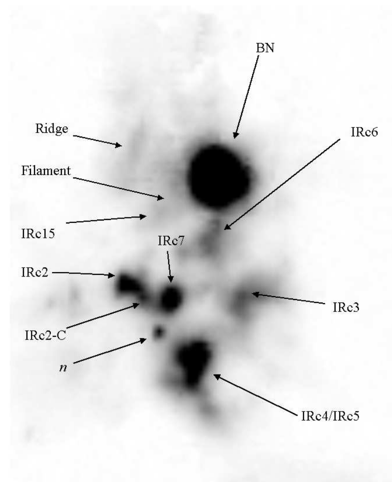

Fig. 1. 10 μm image of the BN/KL nebula. North is up, East to the left.

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