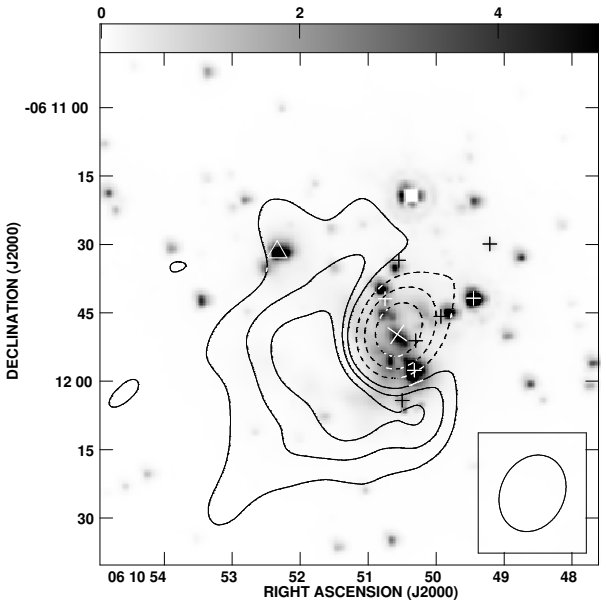

Fig. 1. Near-IR Spitzer image at 4.5 μm (gray scale) superposed on the VLA integrated HI line (from 2 to 20 km s−1) with solid (emission) and dashed (absorption) contours (−20, −10, −3, 3, 6, and 9 × 0.7 mJy beam^{-1} km s^{-1}). The large 'X' symbol indicates the radio continuum peak position of the HII region and the triangle the peak position of H_2O maser. The crosses mark the peak position of the compact radio sources reported by Gómez et al. (2002).

depth of the region producing the HI absorption is one-half of the diameter of the region with HI emission (∼0.2 pc) an estimate of the average neutral hydrogen density is $n_{HI} \geq 3.5 \times 10^3$ cm^{-3}. Based on this estimation of the neutral hydrogen density it is clear that the compact HII region is embedded in high density atomic gas. Gómez et al. (1998), using observations of the H92α recombination line, interpreted the kinematics of the HII region as a champagne flow.

In order to probe the nature of the morphology for the observed HI gas i.e. verify if it follows a champagne flow, position-velocity diagrams (PV) were made from the HI emission along two perpendicular directions centered on the compact HII region (peak continuum emission). The orientations chosen for the PV diagrams correspond to the orientations of the minor (p.a. +25°) and major axes (p.a. −65°) of the ionized cometary HII region (Gómez et al. 1998). The HI line in absorption is broad and ranges from 5 to 13 km s^{-1} at the position of the HII region. At this same position the HI emission reaches a maximum velocity of 18 km s^{-1}. Using the value of 11.5 km s^{-1} (Qin et al. 2008) for the velocity of the ambient molecular gas toward GGD 14, we interpret the broad HI line as an indicator of an expanding shell of atomic gas around the HII region, with an expansion velocity of ∼6.5 km s^{-1}. The PV diagram along the major axis shows that the HI emission is more extended toward the SE direction than toward the NW if we take as a reference the HII region, reaching velocities in the tail of about 14 km s^{-1}. Given that the molecular ambient gas has a velocity of 11.5 km s^{-1}, the assymetry in the PV diagram along the major axis is interpreted as a champagne flow in the HI gas. This cometary morphology in both the continuum and the HI emission is also observed only toward another HII region: G111.61+0.37, where a champagne interpretation was also proposed (Lebrón et al. 2001).

Dense molecular gas exist in the vicinity of G213.880-11.837 (Qin et al. 2008), where a cluster of low-mass pre-main-sequence stars has been found using radio continuum observations (Gómez et al. 2000). Infrared studies in the 2−100 μm range (Harvey et al. 1985; Hodapp 1994; Fang & Yao 2004) also provide evidence for a recently formed cluster of sources in the vicinity of G213.880−11.837. Estimates of the age for this cluster are in the order of 2−5 × 10^6 yr (Fang & Yao 2004). The expansion of the HII region may be triggering the star formation in the molecular cloud which at the same time is responsible of the champagne flow observed in the neutral and the ionized gas toward GGD14.

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