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A SUBARCSECOND RADIO BINARY ASSOCIATED WITH AFGL 4029

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We present sensitive, high angular resolution (0″.3) Very Large Array observations made at 3.6 cm of the bright infrared source AFGL 4029. We find that the radio source G 138.295+1.555, associated with AFGL 4029-IRS1, is actually a subarcsecod binary. There is also fainter emission extending in the east-west direction and emanating from G 138.295+1.555(S), the southern component of the binary. We then identify G 138.295+1.555(S) as the exciting source of the optical and molecular outflow observed in this region.

AFGL 4029 is a bright infrared source embedded in the bright-rimmed molecular cloud IC 1848. It harbors a cluster of massive young stars (Deharveng et al. 1997). The two main sources of infrared emission are AFGL 4029-IRS1 and AFGL 4029-IRS2, separated by about 20″ in the east-west direction. We carried out VLA observations in the A configuration of the region in 1997 January 5. We detected 3.6 cm emission from the regions G 138.295+1.555 (AFGL 4029-IRS1) and G 138.300+1.558 (AFGL 4029-IRS2) previously reported by Kurtz, Churchwell, & Wood (1994).

We find that G 138.295+1.555 is a double source separated by about 0″.6 in the north-south direction (see Figure 1). The southern component has faint emission with an orientation similar to that of the large-scale optical outflow, suggesting that it is its exciting source. The northern component is time-variable and probably a low-mass young object.

G 138.300+1.558 is a cometary H II region that requires a B1 ZAMS star to maintain its ionization (Figure 2).

A full description of this work can be found in Zapata, Rodríguez, & Kurtz (2001).

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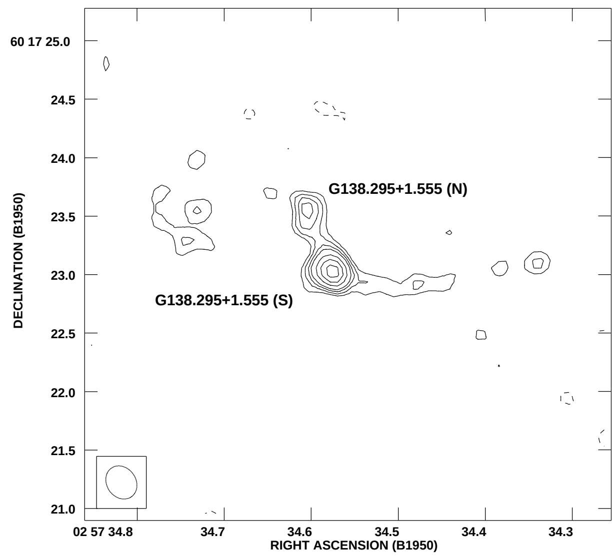

Fig. 1. CLEANed high angular resolution 3.6 cm map of G 138.295+1.555. Contours are −4, −3, 3, 4, 5, 6, 8, 10, and 12 times the rms noise of 12 μJy beam^{-1}.

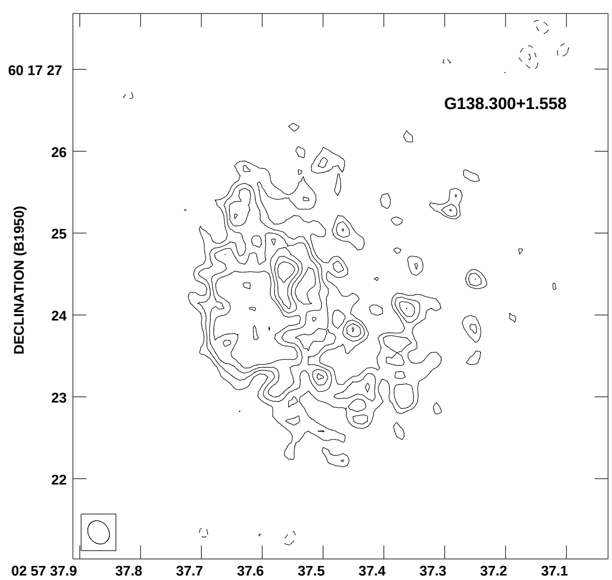

Fig. 2. CLEANed high angular resolution 3.6 cm map of G 138.300+1.558 with the same contour levels as in Fig. 1

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