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A molecule-rich torus-like structure in the 21 μm source IRAS 23304+6147 *(Corrigendum)*

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In the original paper (Sun et al. 2025), the east–west orientation was inadvertently reversed when assigning cardinal directions to several sky-projected images and spatial cuts. The images, coordinate axes, observational data, and model calculations themselves remain unchanged. However, the directional labels and the corresponding descriptions in the text and figure captions should be corrected.

In the standard astronomical orientation adopted by the maps, east is to the left and west is to the right. Consequently, the directions NW, NE, SE, and SW in the affected passages should be replaced by NE, NW, SW, and SE, respectively.

The description of the channel maps in Sect. 3.2 has been corrected as follows. The channel maps of the CO, ^{13}CO, and HC_3N lines are shown in Figs. B.1–B.3. An inspection of these maps reveals that the intensity distributions strongly depend on velocity. In the red channels ($V_{LSR} > -3$ km s^{-1}), the elongated ellipsoid (EE) appears as a bright spot located in the NE region, whereas in the blue channels ($V_{LSR} < -29$ km s^{-1}), the bright region of the EE is shifted to the SW. The behavior of the equatorial density enhancement (EDE) in the channel maps is opposite to that of the EE. The channel maps of ^{13}CO and HC_3N (Figs. B.2 and B.3) show that the crescent-shaped EDE emission shifts from the SW to the NE from the red to the blue channels ($V_{LSR} = -8$ to -27 km s^{-1}). This clearly demonstrates that the major axis of the EE is inclined toward us in the SW, and the EE expands faster along the major axis than the EDE.

The corrections to the directional labels and the corresponding descriptions in the captions of Figs. 6, 4, and 7 of the original paper are shown in Figs. 1, 2, and 3, respectively.

The corresponding sentence in Sect. 4.2.1 of the original paper has been corrected as follows. In the direction of the EE major axis (the left panels of Fig. 7), the intensity profiles of the ^{13}CN and HC_3N lines are asymmetric, and the peak intensities slightly shift to the SW.

These corrections only involve the cardinal-direction labels and the assignment of the EE's southwestern side (instead of the southeastern side) as the region inclined toward the observer. All measured line intensities, spatial distributions, velocity structures, model parameters, chemical interpretations, and the conclusions drawn in the original paper remain unchanged.

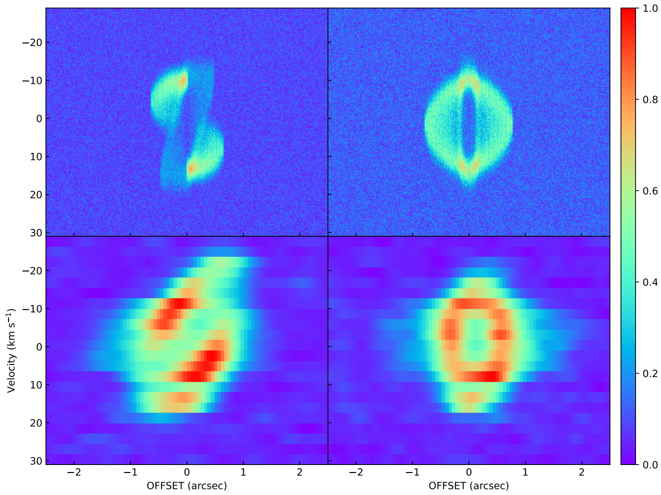

Fig. 1. P-V diagrams of the ^{13}CO $J = 2$–1 transition derived from the modeling (upper panels) and observations (lower panels). The left panels present the velocity structure along the major axis of the EE, oriented from the NE to SW, where negative offsets indicate the NE direction. The right panels show the velocity structure along the minor axis, oriented from the SE to NW, with negative offsets corresponding to the SE direction. The cuts we used to extract these diagrams are detailed in Fig. 2.

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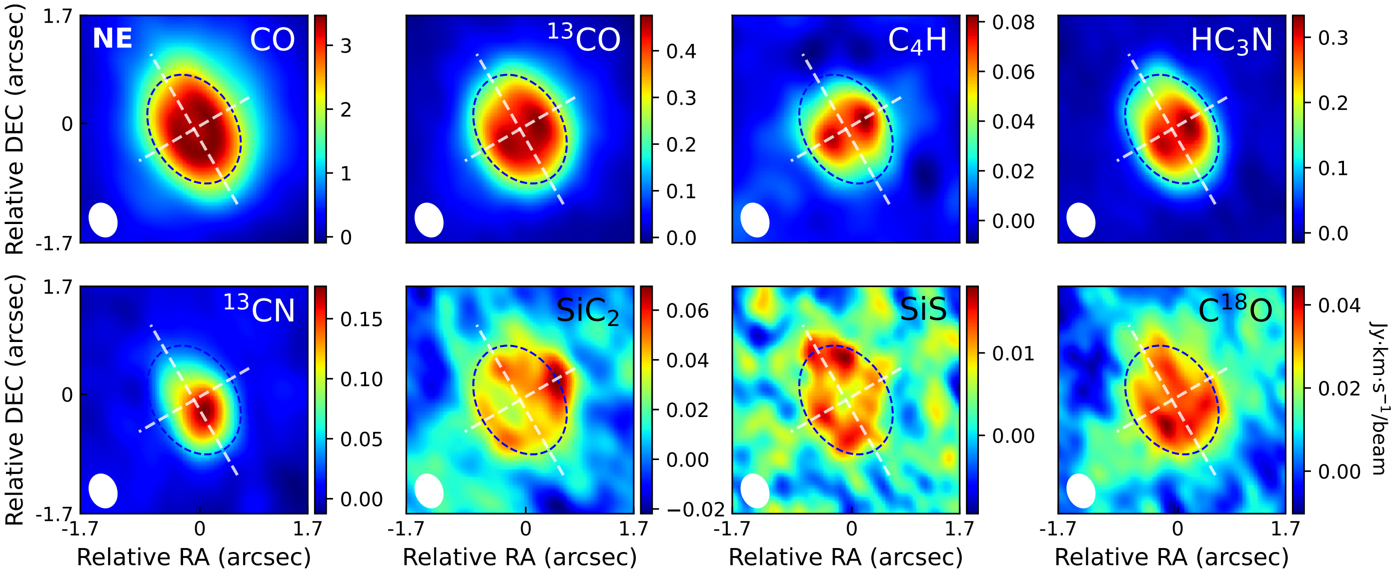

Fig. 2. Integrated-intensity (moment-zero) maps of the molecular lines detected in IRAS 23304+6147. The white ellipse in the lower corner represents the synthesized beam. For convenience, the dashed elliptical circles in each panel indicate the main CO emission region, whose semi-major (PA= 30°) and minor axis (PA= 60°) are 1.16″ and 0.84″, respectively, and the dashed straight lines mark the size of the extended CO halo. The NE direction is marked in the upper-left corner of the CO map.

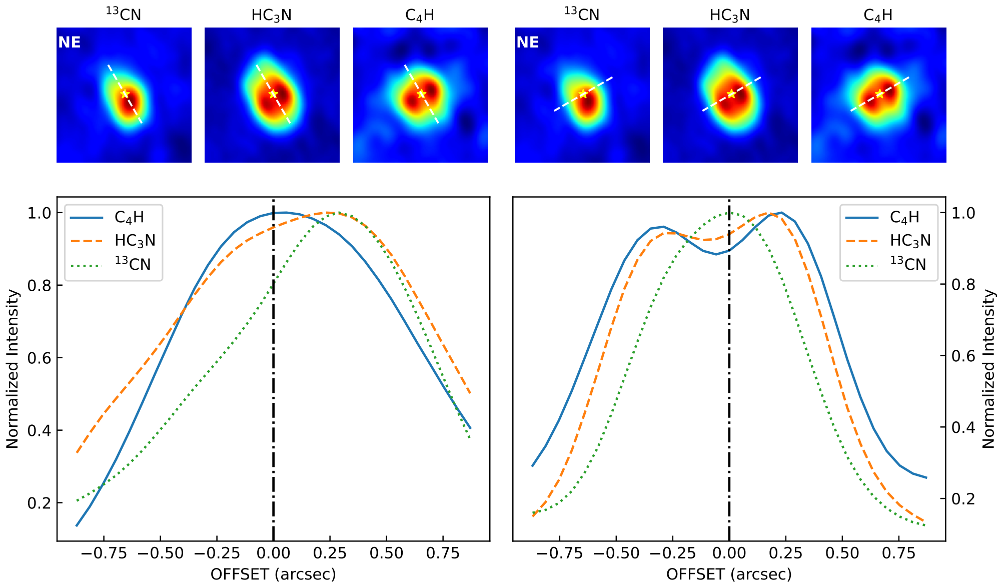

Fig. 3. Spatial distributions of the ^{13}CN, HC_3N, and C_4H molecules. The NE direction is marked in the upper left corner of the ^{13}CN map. The left panels show the molecular line intensity distributions in the major-axis direction, tracking a path from the NE to SW (the offset changes from negative to positive) at a PA of 30° relative to the NS direction. The right panels show the molecular line intensity distributions in the minor-axis direction, tracking a path from the SE to NW (the offset changes from negative to positive) at a PA of 60°. In the upper panels, the dashed lines denote the paths along which the line intensity profiles were extracted. The positions of the phase centers are denoted by the pentagrams in the upper panels and the vertical dashed lines in the lower panels.

References

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