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Erratum: “Molecules with ALMA at Planet-forming Scales (MAPS). III. Characteristics of Radial Chemical Substructures” (2021, ApJS, 257, 3)

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In the published article, we computed the disk size in 18 molecular emission lines and the 90 and 260 GHz continuum for all sources (Section 3.5). We defined R_{gas} as the radius which encloses 90% of the total line emission or continuum flux. However, we omitted the necessary factor of $2\pi r$ when computing the cumulative sums, i.e., the integral of a radial function has an areal element of $2\pi r dr$.

Table 2 is revised and lists the updated gas and continuum disk sizes, and Figures 15 and 16 are also updated. For all sources, the disk size of each line increases in nearly all cases, with mean increases of 45% (IM Lup), 47% (GM Aur), 22% (AS 209), 44% (HD 163296), and 43% (MWC 480). The most notable changes are $\gtrsim 100\%$ increases in the continuum sizes of the IM Lup and MWC 480 disks. The continuum emission in the AS 209 disk is no longer smaller than the majority of lines, and instead it is slightly larger than the complex nitriles and comparable to that of C_2H 3–2 and CS 2–1.

Overall, the relative ordering of disk sizes among lines remains approximately the same, as shown in Figures 15 and 16, and all subsequent discussion and conclusions presented in the published article remain unchanged.

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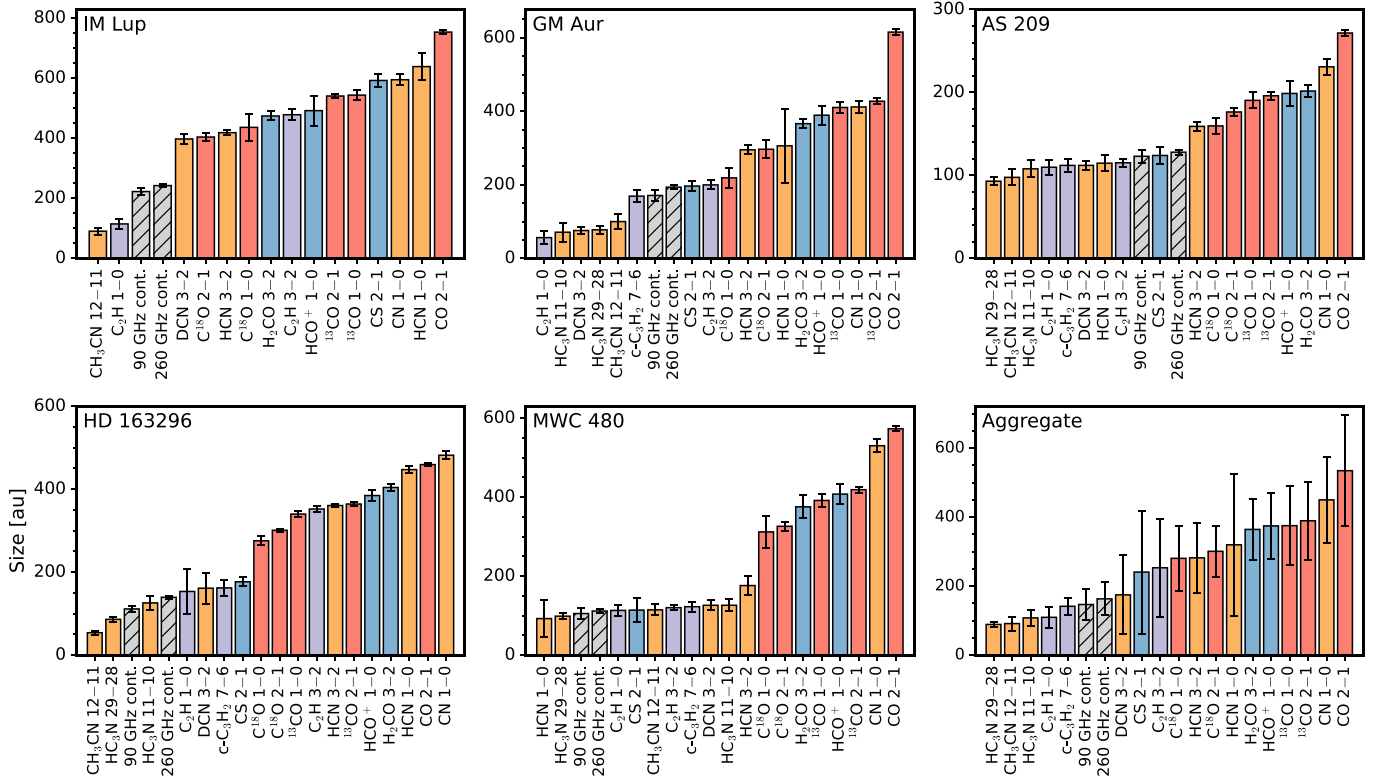


Figure 15. Gas disk size for all lines organized by increasing sizes within each disk. Sizes are color coded by species, as described in Section 3.5. The size of the 90 and 260 GHz continuum disks are shown as gray hatched bars for comparison. The aggregate panel shows mean sizes of each line across the MAPS disks with error bars showing the standard deviation. Disk sizes are defined as the radius containing 90% of total flux.

Table 2
Gas Disk Sizes

| Line | Disk Size (au) | | | | |
|-------------------------------------|----------------|-----------|----------|-----------|----------|
| | IM Lup | GM Aur | AS 209 | HD 163296 | MWC 480 |
| CO 2–1 | 753 ± 6 | 616 ± 9 | 272 ± 4 | 459 ± 4 | 573 ± 7 |
| ¹³ CO 2–1 | 540 ± 7 | 427 ± 9 | 196 ± 5 | 364 ± 4 | 419 ± 7 |
| ¹³ CO 1–0 | 543 ± 16 | 410 ± 16 | 190 ± 10 | 340 ± 8 | 392 ± 17 |
| C ¹⁸ O 2–1 | 404 ± 14 | 297 ± 24 | 176 ± 5 | 301 ± 4 | 326 ± 11 |
| C ¹⁸ O 1–0 | 436 ± 45 | 219 ± 26 | 160 ± 9 | 275 ± 11 | 312 ± 40 |
| C ₂ H 3–2 | 478 ± 18 | 200 ± 12 | 115 ± 5 | 352 ± 8 | 120 ± 7 |
| C ₂ H 1–0 | 114 ± 15 | 56 ± 17 | 110 ± 9 | 153 ± 55 | 113 ± 14 |
| c-C ₃ H ₂ 7–6 | ... | 169 ± 16 | 112 ± 8 | 162 ± 20 | 122 ± 13 |
| H ₂ CO 3–2 | 474 ± 15 | 366 ± 13 | 202 ± 7 | 404 ± 9 | 375 ± 29 |
| HCO ⁺ 1–0 | 492 ± 50 | 389 ± 25 | 199 ± 15 | 385 ± 13 | 408 ± 26 |
| CS 2–1 | 592 ± 21 | 197 ± 13 | 124 ± 10 | 177 ± 11 | 114 ± 31 |
| HCN 3–2 | 418 ± 9 | 295 ± 13 | 159 ± 5 | 361 ± 4 | 176 ± 24 |
| HCN 1–0 | 638 ± 45 | 306 ± 100 | 115 ± 9 | 447 ± 9 | 92 ± 47 |
| DCN 3–2 | 397 ± 17 | 76 ± 10 | 112 ± 6 | 161 ± 37 | 126 ± 12 |
| HC ₃ N 29–28 | ... | 77 ± 11 | 93 ± 5 | 86 ± 6 | 98 ± 8 |
| HC ₃ N 11–10 | ... | 71 ± 26 | 108 ± 10 | 126 ± 16 | 126 ± 15 |
| CN 1–0 | 594 ± 18 | 412 ± 16 | 231 ± 9 | 482 ± 9 | 530 ± 16 |
| CH ₃ CN 12–11 | 90 ± 12 | 100 ± 21 | 98 ± 10 | 54 ± 5 | 114 ± 14 |
| 90 GHz continuum | 222 ± 10 | 171 ± 14 | 123 ± 8 | 111 ± 6 | 105 ± 13 |
| 260 GHz continuum | 242 ± 4 | 194 ± 5 | 128 ± 3 | 139 ± 3 | 111 ± 5 |

Note. Disk size was computed as the radius which encloses 90% of the total disk flux (see Section 3.5). Note that this is often smaller than the total radial extent of an emission line due to the presence of diffuse, low flux emission at large radii.

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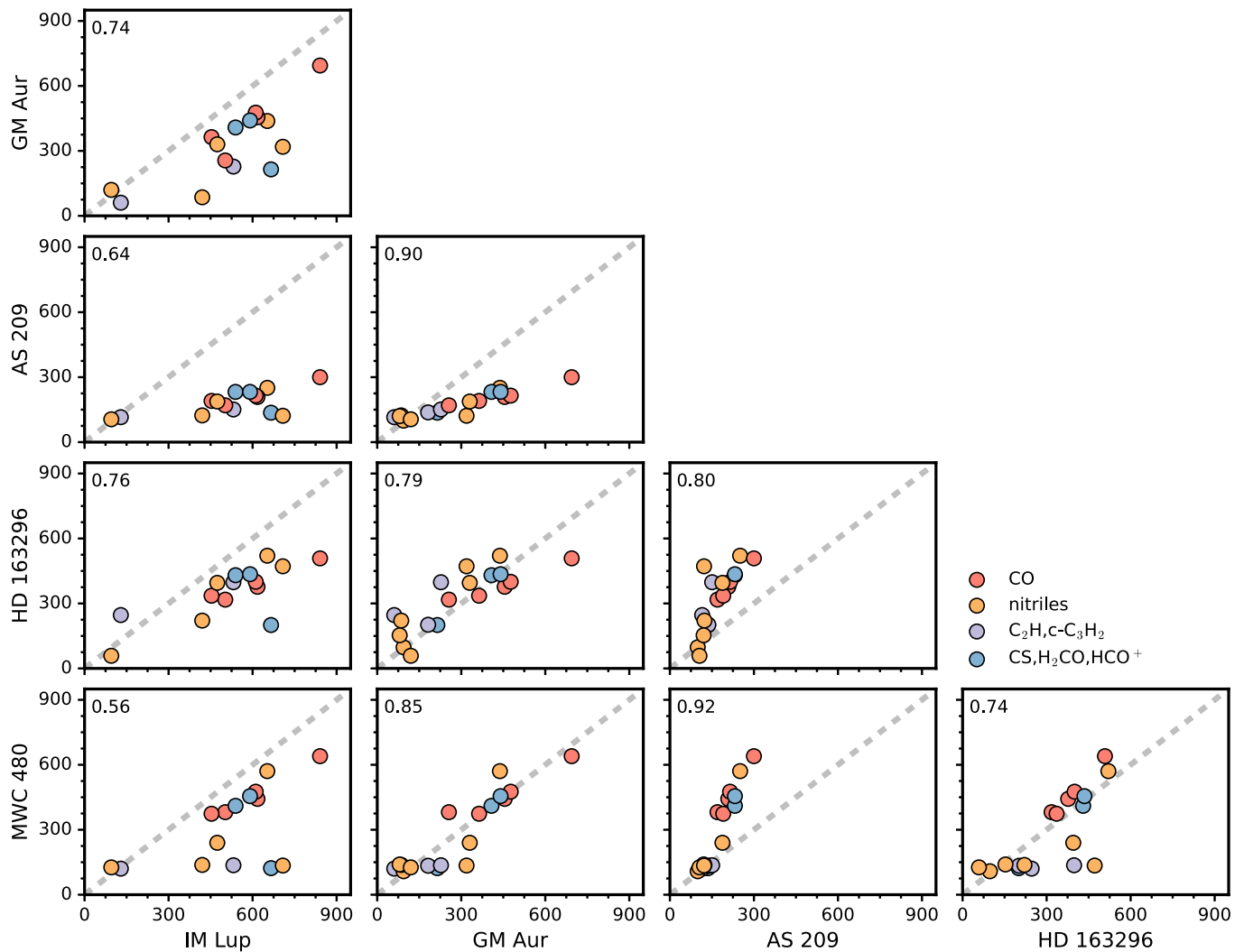


Figure 16. Gas disk size of chemical species in astronomical units for each disk plotted against one another. Spearman correlation coefficients are displayed in the upper left corners of each scatter plot. A one-to-one size ratio is shown as a gray dashed line. Sizes are color coded by species according to the legend. In general, the distribution of sizes in different species is quite consistent among disks.

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