VUV SURVEY OF ^{12}CO/^{13}CO IN THE SOLAR NEIGHBORHOOD WITH *HST*

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VUV measurements of $A - X$ (4th positive) absorption bands of CO can yield precise column densities along interstellar sight lines. We analyzed 21 sight lines to deduce both ^{12}CO and ^{13}CO column densities in diffuse molecular clouds within the solar neighborhood (toward stars approx. 100 to 1000 pc away). The data were obtained from the *Hubble Space Telescope* archive, and include 18 sight lines observed with STIS ($\lambda/\Delta\lambda$ = 46,000—160,000) and 3 that were observed with GHRS ($\lambda/\Delta\lambda$ = 19,000—85,000). Three more stars for which we previously published ratios of ^{12}CO/^{13}CO were added to sample. The average value of the isotopic carbon ratio in the solar neighborhood is known to be 70 ± 7, as determined from radio observations of rotational transitions in emission from high-density molecular clouds. This ratio is the "parent" of the CO isotopomeric ratios, which are known to be affected by two opposing fractionation processes, selective photodissociation and isotopic charge exchange with C^+. Here we find that 40% of the ^{12}CO/^{13}CO values are within 2 σ of the carbon average, while most sight lines show that CO is fractionated to higher and lower values by a factor of ≤ 2.

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