

A 1 AND 2mm SURVEY OF THE CARBON-RICH STAR IRC+10216: A FOCUS ON ISOTOPES

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A 2 mm survey has been conducted of IRC+10216 (135-175 GHz) using the new 2 mm receiver of the Arizona Radio Observatory (ARO) 12 m, coupled with the ARO Wideband Spectrometer (AROWS) 4 GHz backend. The mixers were developed at ARO and have exceptional noise temperatures. Due to the unparalleled sensitivity of this new receiver, a peak-to-peak noise of 3 mK was achieved over the whole frequency range. Over 900 lines were measured in this survey, many of which were previously undetected in prior surveys. Many of these lines display intensities of 1 or 2 mK and have yet to be identified. Combined with an ongoing survey of the 1mm (215-285 GHz) with the ARO SMT and previous data from a 3 mm (67-115 GHz) survey conducted by the Ziurys group, several molecules, including CCH, C₄H, CN, and their ¹³C isotopologues are being analyzed across a large frequency range, using the ESCAPEDE code. From these data, a comprehensive study of the ¹²C/¹³C ratio for IRC+10216 is being carried out. Preliminary results indicate a ¹²C/¹³C ratio of ~38, but this value will be further refined. Other isotope ratios will also be examined.