HIGH RESOLUTION LASER SPECTROSCOPY OF $Mg^{12}C^{12}CD$, $Mg^{13}C^{13}CH$ AND $Mg^{12}C_4H$

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Carbon and magnesium are abundant elements in the interstellar medium, so it is possible that carbon chain molecules containing a magnesium atom may exist in this environment[1].With this in mind, radical molecules of the form $MgC_{2n}H$ (n = 1,2,3) have been frequent subjects of both experimental and theoretical studies[abcdef]. In this presentation we will discuss our high-resolution experiments of the $\tilde{A}^2\Pi - \tilde{X}^2\Sigma^+$ transitions in the isotopologues $Mg^{12}C^{12}CD$ and $Mg^{13}C^{13}CH$, which complement our earlier investigation of this spectrum in $Mg^{12}C^{12}CH$[b]. The data permit us to determine the lengths of individual bonds to high precision. In addition, we have expanded on previous studies of the $\tilde{A}^2\Pi - \tilde{X}^2\Sigma^+$ transition of $Mg^{12}C_4H$, conducted at medium resolution. The parameters obtained from our high-resolution spectra are compared with those obtained from theoretical structure calculations.

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