USING MULTI RESONANCE EFFECTS TOWARDS SINGLE CONFORMER MICROWAVE SPECTROSCOPY

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The relationship between the molecular structure and rotational frequencies makes rotational spectroscopy highly structural specific and an ideal tool for complex mixture analysis. The modern developments in broadband microwave techniques have immensely reduced the data acquisition time, while creating a need for high speed data analysis procedures. A new microwave-microwave double resonance method will be introduced, to perform single conformer/isomer microwave spectroscopy in complex chemical mixtures. The method combines the selective excitation schemes possible in chirped pulse microwave spectroscopy with multi-resonance effects observed upon sweeping in the rapid adiabatic passage regime, enabling perturbations to be induced in the intensities of most of the transitions ascribable to a single molecular constituent (e.g. a conformational isomer) in a mixture. Details of the method, experimental implementation and future challenges will be discussed.