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## **(G\*) (POS-36) Theory of Multi-Frequency Raman Generation with Chirped Pulses**

*Tuesday 20 June 2023 17:34 (2 minutes)*

Multi-frequency Raman generation (MRG) is a high order stimulated Raman process that can produce ultra-short laser pulses with high intensities. In experimental realizations of MRG, phenomena arise such as a single sideband shifted to a lower frequency on each of the Raman order peaks. These phenomena are not explained by previous theory. We derive analytic expressions for properties of MRG, such as the spectrum, to determine the processes leading to the experimental phenomena. These processes predict experimental changes to reduce or enhance the sidebands. Our theory makes use of the Dawson function and its many useful properties such as its equivalence to the Hilbert transform of a Gaussian function and its simple behaviour for very small and large values. This technique allows us to obtain analytic and perturbative results rather than the numerical results usually obtained in MRG theory.

### **Keyword-1**

Ultrafast laser

### **Keyword-2**

Raman

### **Keyword-3**

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