

## HARDWARE ACCELERATED SOLUTIONS FOR SPECTROSCOPY

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The graphical processing unit (GPU) offers massive speed advantages in a variety of spectroscopic applications. Single and dual optical frequency comb experiments generally require massive amounts of repetitive signal transformations. We demonstrate continuous, effectively indefinite readout for a comb-based optomechanical accelerometer by performing millions of Fourier transforms and lineshape fit iterations per second with a scheme that is applicable to many comb and chirp-based experiments. Within the realm of molecular absorption and emission spectroscopy, Hartmann-Tran lineshape generation speed is also heavily accelerated with the GPU, with lineshape improvements of 3-4 orders of magnitude compared to standard Python packages. These two examples lead to the possibility of real-time broadband sensing applications for molecular targets using inexpensive, mass-produced hardware.