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Fundamentals of Heterodyne-Detected Vibrational Sum-Frequency Generation and Its Extension to Solid/Liquid Interfaces

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Date: Wednesday, July 20, 2022 10:00-11:00**Venue: 31A, 3F Faculty of Engineering Bldg. 2
／Online (hybrid)****For online zoom participants, register by July 15.
<https://forms.gle/qtRdaksUphmiYx7w9>**

Abstract:

Since Ron Shen first reported in 1987, second-order (more generally even-order) nonlinear spectroscopy, namely second harmonic generation and sum-frequency generation, has been known as interface-selective spectroscopy. After several technological developments, such as heterodyne detection, it has become a powerful tool for studying the structure and dynamics of molecules at interfaces. In particular, it is regarded as the most powerful tool for studying liquid interfaces, which cannot be brought into an ultrahigh vacuum chamber. In this seminar, I will first summarize the fundamentals of heterodyne-detected vibrational sum-frequency generation spectroscopy and its applications to the air/water interface. Second, I will show the extension of this technique to buried solid/liquid interfaces such as electrode/electrolyte and polymer/water interfaces. Then the potential applications and future direction will be discussed, aiming for possible collaborations with engineering science.

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