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# Laser-plasma schemes of narrowband THz emission for THz electron acceleration

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One promising method to overcome the vacuum-breakdown limitation in conventional RF-linacs is to use high-frequency fields such as terahertz radiation. To be useful in accelerators, narrowband sources of THz emission are preferable since they can focus more energy into the desired band that fits the accelerating tube. However, laser-plasma-based THz schemes currently available are generally wideband and generate only a few-cycle pulses, even though they are efficient at generating strong peak fields. The system efficiency is, therefore, low since only a selected band from the emission is used for acceleration. In this talk, I present several new ideas that can generate quasi-narrowband THz emission from laser-driven plasmas. One idea involves using plasma-dipole-oscillation, which routinely yields a very narrow spectrum of THz with an efficiency of more than 0.1%. Another idea involves concentrating the THz spectrum around the beat frequency of two driving laser pulses. Overall, this talk focuses on the development of more efficient and effective methods for generating narrowband THz emission from laser-driven plasmas, which could potentially improve the efficiency of THz-based accelerators and other applications requiring high-energy terahertz radiation.

## Speaker's Name

MinSup Hur

## Speaker's Title

Prof.

## Speaker's Gender

Man

## Speaker's Pronouns

He/Him

## Speaker's Preferred name (if any)

**Primary author(s) :** HUR, MinSup (UNIST)

**Presenter(s) :** HUR, MinSup (UNIST)

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