藉由電光取樣量測光電式兆赫波發射器之特性

Characterization of a THz Photonic Transmitter by Electro-Optic Sampling

本論文的主要目的是利用電光取樣方式量測光電式兆赫波發射器包括其主要元件近彈道單載子光偵測器的輸出特性。為此我們建立一套電光取樣系統量測近彈道單載子光偵測器所產生的電脈衝訊號，在頻域上會有中心頻率在 26.65 GHz 和 80 GHz 的兩個頻段，前者是由多重反射所組成的週期現象，後者即為元件所設計的輸出訊號，而多重反射的現象是由於量測系統的阻抗不匹配所造成的結果。

The main purpose of my thesis is the characterization of a THz photonic transmitter (PT) and its main component a near-ballistic uni-traveling-carrier photodiode (NBUTC-PD) by using electro optic (EO) sampling. Here, we constructed an EO sampling system to characterize the waveform of electric pulses generated by a NBUTC-PD, In the frequency domain, we can see that there are two bands one is at 26.65GHz and the other one is near 80GHz. The former one corresponded to the period of multi-reflected spurious signal. The 80GHz band, on the other hand, is the designed output of the PT. Multiple reflections are tentatively attributed by the impedance mismatch of the measured setup.