The new diagnosing method basing on the frequency analysis of human’s nails in T-RAY

Pengcheng Ma*, Long Xiao

Wuhan National Laboratory for Optoelectronics, College of Optoelectronic Science and Engineering, Huazhong University of Science and Technology, Wuhan 430074, China

*pengchengma@smail.hust.edu.cn

Abstract. It has been reported that many kinds of sickness can be reflected in one’s nails. And because of the special composition and structure of nails, they are very suitable for T-ray detecting. Therefore we want to see whether we can diagnose some sickness by only analyzing the transmission of the nails. The experiments consist of three parts. In the first part, we took 200 samples which came from about 20 years old people. By that way, we got that the peak transmission wavelengths of human’s nail is about 1.7THz and we almost acknowledged the characteristics of nails. Then we changed our samples coming from different ages, and some interesting phenomenon were coming out. Lastly, by detecting the nails which are taken from special patients, we discovered some sickness can be detected using T-ray.

1. Introduction

Lying between the microwave and the infrared, the terahertz (THz) frequency radiation has been proven to be a fertile region in the electromagnetic spectrum and a powerful tool in diagnosing sickness, scientific research and many applications. As the advance of femtosecond laser and the realization of travelling wave electro-optic detection technique, terahertz time-domain spectroscopy (THz-TDS) has been widely used in many field, such as, condensed matter physics,[2,3] biological detection,[4,5] material characterization,[6,7] and near-field imaging,[8] etc. As THz-TDS is different from traditional optical measures, it measures the THz electric field \( E(t) \) directly, and its Fourier transform \( E(\omega) \) directly yields both amplitude and phase information at the same time. This feature makes THz-TDS a very convenient and valuable tool to study material.[9,10,11]

The theoretical figure of THz-TDS is introduced just as Fig. 1. Photoconductor antenna, illuminated by ultrashort laser pulses, is used for THz radiation and detection. The pumping laser should provide the pulses of 760-840 nm wavelength, 50-150 fs pulse duration and 50-500 mW output power at approx 80 MHz pulse repetition rate. For more efficient collimation and focusing of THz radiation, a substrate lens fabricated from high resistance Silicon is attached to the backside of each antenna.
2. The designing of experiments

It has been reported that many kinds of sickness can be reflected in one’s nails. And the nails are very suitable for T-ray detecting. Therefore we want to see whether we can diagnose some sickness by only analyzing the transmission of the nails. If it could be achieved, those kinds of sickness could be checked cheaply, harmlessly and conveniently.

In order to get better results, we designed the following instrument to fix the nails (just as show in the Fig.2). The instrument play an important role in this experiment.

3. The analysis of results

In the following Fig.3, the different colorful lines represent different transmission of the samples. We can get that the peaks of transmission are delay. The reason is obviously due to the index of nails. The different delays may cause by the thickness and the index of the different nails.
The intensity of transmission varies with time

When we translated the Fig.3 to Fourier transform, we got the Fig.4, the intensity of transmission varies with frequency. And we discover there is a peak nearby 1.7THz. We guess this may be the characteristic peak of human’s nails. In that way we should concentrate our mind at the analysis of this point. By analyzing this point, we can get the key information. Fig.4 is the range of 1.6THz to 1.8THz. We found almost all the samples have a peak at 1.67THz, except the sample A024’ peak is near 1.72THz. This may be caused by the experiments’ miss. So we conformed the peak is the human’s characteristic one.

If we have the picture enlarged (as Fig.4(b)), we could notice there surely existing a peak at 1.67THz. But to my surprise the intensity of different people are various. Then we checked the basic information of those samples, we have found that both A014 and A015 prefer to drinking tea ordinarily. And sample A024 enjoys coffee very much. From the above-mentioned materials, we inferred that the Caffeine may take a great place in the intensity of the peak. However we discover a fun phenomenon that the intensity has a strong
relationship with one’s GPA. As we can see that the GPA is higher when there exit a higher intensity.

Table.1 The GPA vary with the Intensity

| NUM | A104 | A026 | A027 | A024 | A015 | A022 |
|-----|------|------|------|------|------|------|
| GPA(by 2010/3/2) | 83.53 | 79.63 | 81.03 | 80.72 | 83.44 | 87.32 |
| Intensity      | 0.114 | 0.016 | 0.045 | 0.019 | 0.115 | 0.562 |

As the water plays a great place in the intensity of the peak, so we guess if a student drinks more water, he may get a higher GPA. In that reason, we may use this method to take the place of exams to test the ability of the students. Certainly, some works should be taken to prove our idea.

4. Conclusion

we have got the giant birefringence of human’s nails in T-RAY. We discovered that the characteristic peak of human’s nails is at 1.67THz. And the intensity of the peak may vary with one’s eating habits, Caffeine and the scores. Maybe, by the analysis of one’s nails, can we get his score. And our students can be liberated from examinations. However, some additional experiments should be taken to confirm our ideas.

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