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5G AND ITS FREQUENCY SPECTRUM SPEED

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Abstract
This article reflects on the speed of 5G and its frequency spectrum.

Keywords; Mobile network, radio communication, 5G, communication, communication standards, electromagnetic waves.

Introduction

5G is an abbreviation for the fifth generation cellular standard. The mobile network itself was radically developed in the 50s of the last century, when the first two-way radio communication devices were tested. Each subsequent generation of the network, including 5G, continues to use radio waves for communication and data transmission.

MAIN PART

5G differs from previous communication standards primarily in the speed of its internet connection, which means that it has a speed 100 times higher than now and is able to download large amounts of data faster in a shorter time. Changes associated with the introduction of 5G technologies will radically change life.

5G differs from previous communication standards primarily in the speed of its internet connection, which means that it has a speed 100 times higher than now and is able to download large amounts of data faster in a shorter time. Changes associated with the introduction of 5G technologies will radically change life. Currently, the 5G network in our republic is served by mobile operators in Tashkent using 14 base stations in the 3.4-3.8 GHz radio frequency band with n77, n78 bands, based on the TS 38.101 technical specification of 3GPP.

In the future, in order to further develop the 5G network in our republic and subsequent generations, it was planned to introduce in addition to the 3.4-3.8 GHz radio frequency range in such bands as 700 MGs, 1500 mgs, 1900 mgs, 25 GGs.

The beginning of the global introduction of a new generation of mobile communication in the 5G standard has caused a lot of rumors, controversy and debate. Why do we need this 5G? And is it harmful to human health?

Effective communication of information has been very important at all stages of human development. Intercity communication is especially important because it allows the transmission of information at the highest speed. In the 21st century, our world is so dependent on fast connection in real time that the collapse of communication networks has very serious and unpleasant consequences on a global scale.

Progress in this area is very important. Only a very short and limited person can say right now: the speed of 4G networks is enough for us, we do not need more. Development will probably never stop. As different states and their governments compete for military, political and economic influence, they try to outsmart their competitors in every possible way.

Someone argues that the goal may not be worth the effort and resources? In fact, most often the problems of mankind consisted in the fact that a specific goal was achieved at any cost. It is known that the measures were applied for the benefit of the state, after a while it turned out to be inconvenient for most people.

But is 5G the same situation? At present, all facts indicate that this is not the case. Fifth generation wireless technology (5G) gives us real and clear advantages: high speed, low latency and free communication capability for many devices. Almost all sectors of the economy benefit from applying the new standard. Ordinary users also feel it, because 5G allows you to create an Internet of real things.

Connected home and wearable devices, Fast and stable internet in a smartphone, computer and car, reliable wireless communication with minimal transmission delays, which is important in real-time communication (for example, for autonomous cars, and not only). These are just a few of the benefits granted to companies, individuals, agriculture, medicine, science and other industries.

Let's try to figure out what the new 5G wireless mobile technology is. Let's find out what benefits it has and whether it is dangerous for the environment and for you and me.

Wireless communication systems are the subject of ongoing research and development in both commercial organizations and academia. And like any type of communication, they must be standardized - they must be determined by a certain

number of characteristics of electromagnetic waves on which the network operates. All requirements and restrictions are also set.

The 5G is a direct successor to the 4G standard currently in use. The new standard was designed to support a large number of client devices per unit area. Even the fastest 4G network cannot run as many devices as 5G. The fact is that we are talking about a million receivers per square kilometer. This means that it will be possible to use the internet without problems in stadiums, call distant relatives from a crowded field on New Year's night, or manage a robotic plant with wireless receivers at every step.

5G also means high bandwidth-up to 20 gigabits per second. This is 4 times more than the current 60g networks and 20 times more than Gigabyte optical fibers, which are very popular today as trunk data networks.

As for 5G networks, we are mainly talking about centimeter and millimeter waves (from 3 to 300 GHz, now it is planned to use frequencies of 700 Mhz, 3.4-3.8 and 26 GHz). Nevertheless, they are still radio waves, whose safety for human health under controlled conditions (within current standards) has been approved by the WHO and confirmed by hundreds but not thousands of studies since its discovery in the 19th century. The health effects of 5G are a highly controversial topic, triggering more emotions and assumptions than scientific facts. Let's try to approach this question with a clear head and put all the points on "and".

It should be borne in mind that the term "electromagnetic radiation" is used for the entire spectrum of electromagnetic waves. This category includes radio waves, microwaves, visible light and carcinogenic ultraviolet rays, X-rays, alpha radiation, gamma waves, etc. With a further increase in the frequency of radio waves, in the development of further cellular standards, we finally get ... we achieve the visible frequency of infrared light, which is completely harmless to humans and constantly surrounds us. Infrared light is radiation with a frequency of up to 430000 GGts or 430 TGts.

Radiation power also depends on many factors. Take, for example, microwaves whose frequency coincides with radio waves. Microwave ovens in our homes usually work at a frequency of 2.4 GHz, like Wi-Fi routers. But the sources are very different in strength. In microwave ovens, this figure can reach 700-1000 W, and in routers-only 0.1 W. In addition, when waves in microwave ovens accumulate at one point, in phones, routers or telecommunication towers they spread everywhere. This is where the same fear of routers that existed a few years ago comes from. In addition, it is worth knowing the principles of operation of microwave ovens that heat food by moving water molecules. There is no more complicated "magic". However, if someone

sets up a 1,000 watt telecommunications tower and stays near it for a long time, it can damage them.

In place of the conclusion, so far, there is no clear information even about the distribution of frequencies. Although they are already talking about it, they argue, the issue is actively discussed. Even at the Yalta European Strategy Forum in Kiev last year, the then Minister of infrastructure Mikhailo Fedorov said that we first need to deal with 3G-4G communication, and only then start posting new generation 5G networks. Although it was supposed to start testing 5G base stations in 2020. Of course, the global crisis and the spread of coronavirus are making adjustments to these conditions. But let's hope for the best.

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