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ANALYSES AND RESEARCH IMPACT OF OPEN WAVE TRANSMISSION MEDIUM OF RADIO FREQUENCY RANGES IN THE SATELLITE COMMUNICATION SYSTEMS

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ABOUT ARTICLE

Key words: satellite, transponder, SCS transmission, orbit, satellite communication, downlink frequency, fixed Satellite, coverage, planet, TV/Radio stations, vacuum, broadcasting, radio waves.

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Abstract: In article considered satellite communication work and frequency aspects. And their meaning in telecommunications, radio, and television, internet deliver.

In the continue stated about base elements of the system and their principia's. Stopped on frequency kinds and transmissions. How it can be sent and received.

Talked about frequency, which it is sent by the transponder is downlink frequency. Shoved some pictures of the system. Talked about advantages ind disadvantages of the exploitations. And sphere of use of SCS (Satellite Communications). Given and analyzed comparative tables of the SCS. Analyzed propagation of wave near the Earth's surface, what are referred to as ground waves are often separated into space waves and

surface waves. Given several mathematical expressions.

**SUY'NIY YO'LDOSHLI ALOQA TIZIMLARI RADIOCHASATTALAR
DIAPAZONLARIDA AXBOROT UZATISHDA OCHIQ TO'LOQIN TA'SIRINI TAHLIL
VA TADQIQ ETISH**

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MAQOLA HAQIDA

Kalit so'zlar: sun'iy yo'ldosh, repetitor, SYA signalini uzatish, orbita, sun'iy yo'ldosh aloqasi, past chastotaga ulanish chastotasi, statsionar sun'iy yo'ldosh, qamrov, sayyora, teleradiostansiya, vakuum, radioeshittirish, radioto'loqlar.

Annotasiya: Maqolada sun'iy yo'ldosh aloqasi ishlashi va chastota aspektlari ko'rib chiqildi. Hamda ularning telekommunikatsiya, radio va televidenie, internet yetkazib berishdagi ahamiyati ustida ham to'xtalgan/

Maqolada tizimning asosiy elementlari va ularning tamoyillari haqida so'z boradi. YAT (yo'ldoshli aloqa tizimlari) chastotalari va uzatish turlari va jo'natish va qabul qilish turlari uchun to'xtatildi.

Transponder uzatadigan chastota haqida gapirganda, ulanish chastotasi haqida gapirish muhim. Sun'iy yo'ldosh aloqa tizimining bir nechta rasmlari keltirilgan. Bunday tizimlarni ishlatishning afzalliklari va kamchiliklari tavsiflanadi. Shuningdek SYA (sun'iy yo'ldosh aloqasi) dan foydalanish sohalari ko'rsatilgan. SYA ning qiyosiy jadvallari taqdim etilgan va tahlil qilingan.

АНАЛИЗ И ИССЛЕДОВАНИЕ ВЛИЯНИЯ ОТКРЫТОЙ ВОЛНЫ СРЕДЫ ПЕРЕДАЧИ РАДИОЧАСТОТНЫХ ДИАПАЗОНОВ В СПУТНИКОВЫХ СИСТЕМАХ СВЯЗИ

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О СТАТЬЕ

Ключевые слова: спутник, ретранслятор, передача сигналов ССС, орбита, спутниковая связь, частота нисходящего канала, стационарный спутник, покрытие, планета, теле радиостанции, вакуум, вещание, радиоволны.

Аннотация: В статье рассмотрена работа спутниковой связи и частотные аспекты. И их значение в телекоммуникациях, радио и телевидении, доставка интернета

В статье, и говорится о базовых элементах системы и их принципах. Остановлен видам частот ССС и передачах и видам отправки и приёма.

Говоря о частоте, которую передает транспондер, остановлен о частоте нисходящей тракта связи. Дано несколько картин системы спутниковой связи. Рассказано о преимуществах и недостатках эксплуатации таких систем. И указано сферы использования ССС (спутниковая связь). Приведены и проанализированы сравнительные таблицы ССС. При анализе распространения поверхностной волны, что называемым «земными волнами», остановлен о разделении волн на космические волны и на поверхностные. Даны несколько математических выражений.

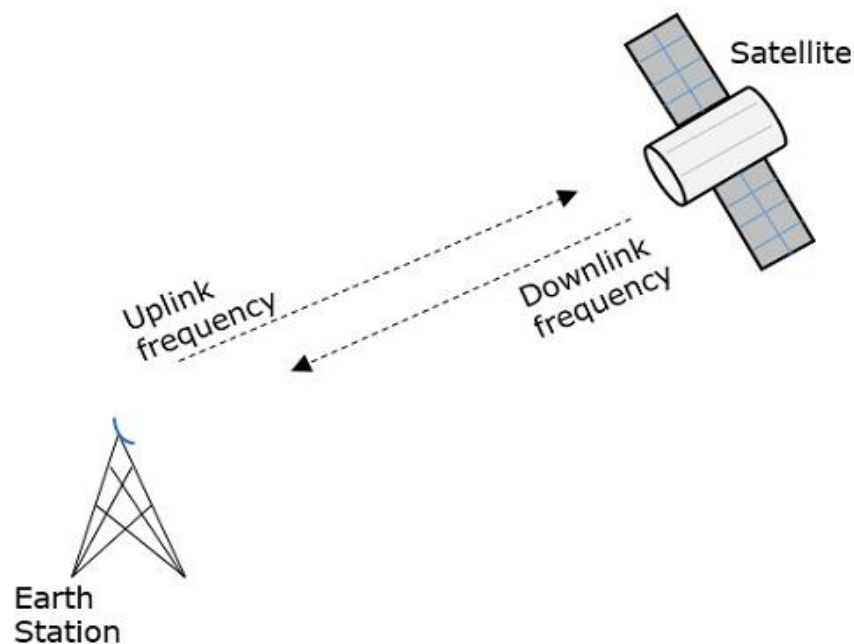
INTRODUCTION

A satellite is an object, that moves around the planet in a mathematically predictable path called an orbit. A communication satellite is nothing but a microwave repeater station in space that is helpful in telecommunications, radio, and television along with internet applications.

A repeater is a circuit which increases the strength of the signal it receives and retransmits it. But here this repeater works as a transponder, which changes the frequency band of the transmitted signal, from the received one.

The frequency with which the signal is sent into the space is called Uplink frequency, while the frequency with which it is sent by the transponder is downlink frequency.

The following figure illustrates this concept clearly.



Picture 1. The pattern of SCS transmission by open area medium

Now, let us have a look at the advantages, disadvantages and applications of satellite communications.

Advantages of SSC

There are many Advantages of satellite communications such as:

- Flexibility
- Ease in installing new circuits
- Distances are easily covered and cost doesn't matter
- Broadcasting possibilities
- Each and every corner of earth is covered
- User can control the network

Satellite Communication – Disadvantages. Satellite communication has the following drawbacks:

1. The initial costs such as segment and launch costs are too high.
2. Congestion of frequency
3. Interference and propagation
4. Satellite Communication – Applications

Satellite communication finds its applications in the following areas:

5. In radio broadcasting.
6. In TV broadcasting such as DTH.
7. In Internet applications such as providing Internet connection for data transfer, GPS applications, Internet surfing, etc.
8. For voice communications.
9. For research and development sector, in many areas.
10. In military applications and navigations.

The orientation of the satellite in its orbit depends upon the three laws called as Kepler's laws.

THE MAIN RESULTS AND FINDINGS

International organizations try to keep the use and controls transition usage and prevent faults. There are some of radio frequency ranges use in satellite communications. For example, C, X, Ku, Ka and even EHG or V-band.

A signal transmission medium is a system or substance that can be propagate of signals for the purposes of telecommunication. Signals are typically imposed on a wave of some kind suitable for the chosen medium. For example, data can modulate sound, and a transmission medium for sounds may be air, but solids and liquids may also act as the transmission medium. Vacuum or air constitutes a good transmission medium for electromagnetic waves such as light and radio waves.

In the USA, the Federal Communications Commission periodically holds frequency auctions to sell possibility spectrum. Unauthorized use of regulated frequencies without authorization by the United States government or by its current lease-owner is punishable by fines or jail time. [1]

Satellites have power and regulatory restrictions governing which frequencies they may use. Plus, there are other requirements such as weather that may restrict use of certain frequencies. Below given a table of the approximate ranges of each frequency band.

SATELLITE FREQUENCIES (Ghz)		
BAND	DOWNLINK	UPLINK
C	3.700 - 4.200 Ghz	5.925 - 6.425 Ghz
X (Military)	7.250 - 7.745 Ghz	7.900 - 8.395 Ghz
Ku (Europe)	FSS Fixed Satellite Service (Geostationary Communications Satellites for TV/Radio stations and networks): 10.700 - 11.700.	FSS Fixed Satellite Service (Geostationary Communications Satellites for TV/Radio stations and networks) & Telecom: 14.000

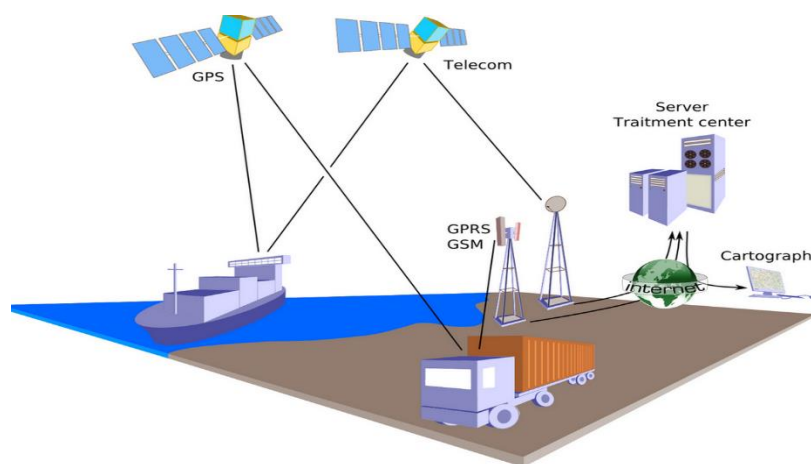
	<u>DBS</u> Direct Broadcast Satellite: 11.700 - 12.500. Telecom: 12.500 - 12.750	- 14.800 <u>DBS</u> : 17.300 - 18.100
Ku (America)	<u>FSS</u> Fixed Satellite Service (Geostationary Communications Satellites for TV/Radio stations and networks): 11.700 - 12.200 <u>DBS</u> Direct Broadcast Satellite (Consumer direct-to- home Satellite TV) : 12.200 - 12.700	<u>FSS</u> Fixed Satellite Service (Geostationary Communications Satellites for TV/Radio stations and networks): 14.000 - 14.500 <u>DBS</u> Direct Broadcast Satellite: 17.300 - 17.800
Ka	~18 - ~31 GHz	
EHF	30 - 300 Ghz	
V	36 - 51.4 Ghz	

In analyzing propagation near the Earth's surface, what are referred to as ground waves are often separated into space waves and surface waves. A space wave consists of the direct wave from transmitter to receiver and the reflected wave, if any, that reaches the receiver after reflection from the Earth's surface. It is the surface wave that is most strongly affected by the electrical properties of the Earth. The attenuation of the surface wave is high and surface wave propagation is limited to short distances for high frequencies. The surface wave is the principal component of the ground wave for frequencies of a few MHz, is of secondary importance at VHF (30-300 MHz), and can be neglected for frequencies greater than 300 MHz [2].

The electric field intensity at a maritime-mobile receiving antenna, due to signals transmitted from a satellite, is the vector sum of components associated with the direct wave from the satellite, a specularly, coherently reflected wave, and a diffusely, incoherently scattered wave. The magnitude of the reflection coefficient for the specularly reflected wave is decreased below that for a smooth surface by a roughness factor which is described in article and shown specifically by equation.

$$P_s = e^{-(\Delta\phi)^2/2} I_0 (\Delta\phi)^2/2$$

As the specular reflection coefficient decreases due to increasing roughness, There is diffuse scatter becomes important. Diffuse scatter is said to be dominant in practice, with normal sea conditions in most areas, but specular flection plays a role in at least relatively smooth seas.



Picture 1. The simple architecture of SSC transmission medium and system

CONCLUSION

In the article analyzed main types of wave propagation principia of satellite radio system devices and viewed kinds of several waves of this system. Reflected wave is analyzed on the top that for a smooth surface by a roughness factor different.

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