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Influence of the geopathic stress wave on acoustics of halls

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ABSTRACT

Water veins, flowing beneath the surface on the Earth, generate electromagnetic waves. The frequency of these waves is equal to 7.5 Hz. According to the Schumann resonance theory it should be approximately 7.83 Hz. These waves propagate only in the vertical direction and do not propagate along the surface of the Earth. They are also called geopathic stress waves. This effect causes that the flow of water veins can adversely affect people and buildings, causing for example cracking the walls. It can also cause harmful interference to sound propagation. The impact of the water vein is the same at each level of the building (Hall), i.e. on the ground floor and the 10th floor. For these reasons, the distribution of the water vein has a significant influence on the acoustic properties of the room, for example on the distribution of the sound level in the room and the reverberation. This influence can be positive or negative, depending on the circumstances. The experiment has been performed which the results of measurements in the Hall which was a water vein, and the same place, but that the water vein was isolated. There was a difference in sound of the instrument in both cases.

1. INTRODUCTION

Concert halls of all kinds require very precisely fitted acoustic conditions, in order to ensure an optimal sound distribution over the audience, without undesirable disturbing factors. One of these disturbing factors is the water vein, also referred to as geopathic stress wave. It can have both positive and negative influence on humans and buildings, which should then be identified and isolated. A closer examination of the geopathic stress wave is necessary for the isolation of this disturbance factor. In general, the geopathic stress wave is understand as the underground water flow, the vertical vibrations of which reach the earth's surface at a frequency of ca. 7.5 Hz but whose influence extends beyond the earth's surface. The aim of this paper is the analysis of positive or negative influences and effects of the vertical geopathic stress wave on the room acoustical conditions and thus the sound propagation. Aluminum or copper plates must be installed as an insulator in order to reduce the measured values and thus the influence of the negative waves of the water veins. The values before and after the insulation are measured with the use of the measuring instruments: Rayometer PS-10 or L-Rod. These measured values are next compared in order to draw the difference.

2. THEORY OF WATER VEINS (GEOPATIC STRESS WAVES)

Water veins, also referred to as geopathic stress waves, are underground watercourses. If we think of the water cycle of the earth, we usually only imagine the rain, rivers, lakes and the sea. But much more water is placed underground. The percolating rainwater flows further underground and if it does not form springs at other points and reappears on the surface, it collects in large quantities as ground water. Our usual understanding of water flows is that they join and form a wide single stream. But how can they cross each other? The answer is that they flow between several layers of rock which appear often in the earth. It can be noted that water veins up to 1000 meters deep still show their effect on the surface. The difference in depth allows water veins to be located at different heights, depending on the slope of the rock layer. They can flow in different directions, and therefore would look like a crossroads, although they occur at different depths. Since the intersecting water veins have an effect on the earth's surface, their influence directly over of the intersection can increase considerably. Geopathic stress wave forms a distorted or disturbed electromagnetic field on the earth surface. This field disturbs so called Schumann’s waves and Schumann’s resonance (SR). The fundamental frequency of SR is about 7.83 Hz, then the Schumann resonance is falling within the range of brain waves α. The geopathic stress waves distort not only human brain waves, but also waterflows as well as mineral and geological formations.

3. THE SCHUMANN’S RESONANCE

The Schumann’s resonance occurs for frequencies of electromagnetic waves which form waves standing along the circumference of the earth. The effect is named after the German physicist and electrical engineer Winfried Otto Schumann (1888 – 1974). The term earth resonance frequency is also used. The conductive earth surface, which most part consists of the saltwater, and the highly conductive ionosphere above it, form a cavity resonator, from whose dimensions the resonant frequencies can be calculated. These resonances can be excited e.g. by lighting discharges, but they are of very low amplitudes that they can be detected only with very sensitive instruments. The fundamental Schuman’s resonance occurs for frequency, for which the wavelength is equal to the average circumference of the earth. It is equal to f1 = 7.5 kHz, which is close to noted above value 7,83 Hz. Next modes of Schumann’s
wave occur for frequencies 14,3, 20,8, 27,3 and 33,8 Hz [1].

4. DETECTION OF THE GEOPATIC STRESS WAVES (MEASURING METHODS)

4.1 Rayometer PS10

This device is produced by Rayonex Medical GmbH, Germany. It allows for detection of the interference of a water vein with given frequency with human biological field. The measuring procedure is as follows. Take a Rayometer in your hand and set it to the interference frequency 22.50 Hz (Fig. 1). Then connect a hand detector and a wooden rod to the Rayometer. Give the hand detector to a person and then test the rotation of the rod according to physician's medical radiotherapy. If a rotation is shown, the person is currently not in a geopathic load. Then, let the person walk slowly through the room. When you observe that the rotation of the rod changes to a linear motion then the person is at the point with geopathic load with interference frequency of 22.50 Hz. For determination of the disturbance zone, set the device to the value e.g. 46.5 Hz (global grid network) and test it again in the same place. If a rotation of the rod is present, it is already known that there is no global lattice grid. In this case, run the test again at 64 Hz (water line) and 14 Hz (rejection) interference frequencies.

4.2 L-rod

The instrument consists of two wires of stainless steel or aluminum, bent at right angles to the holding position. Rods are held in parallel. As they begin to cross when moving, this indicates that they are approaching the source of the disturbance. After leaving it, the rods return to their original parallel position. This way you can accurately determine the point of the interference source.

5. ACOUSTIC PROPERTIES OF CONCERT HALL OF TRADITIONAL KOREAN MUSIC

The concert hall Gugak FM is located in Seoul (Korea). It specializes in promoting traditional Korean music (Gugak) through a public radio station under the guidance of the Ministry of Culture, Sports and Tourism. Founded on March 2, 2001, the aim of the Gugak FM is to contribute to the cultural welfare and development of traditional Korean culture and arts within communities through promotional, awareness and educational endeavors. As the only broadcasting radio station that specializes in Gugak, the Gugak FM operates several FM radio broadcasting channels that service the Korean peninsula. In addition, the Gugak FM also produces various broadcasting programs and video content related to traditional Korean music.

The main functions and roles of Gugak FM are as follows:
- Produce and operate a Gugak FM program and business
- Provide opportunities for Gugak performances and recordings, as well as conduct and support public relations activities
- Research, create, and educate communities via various Gugak projects with the goal of popularizing traditional Korean music
- Promote and supply traditional Korean culture and arts via various projects
- Revitalize local cultures through various projects
- Support projects for exchanging domestic and foreign Gugak programs and traditional Korean culture and arts.

The floor plan of the hall is presented in Fig. 3.
6. MEASUREMENTS

The selected acoustical parameters in one point have been measured. The measuring point is presented in Fig. 5.

6.1 Reverberation time RT60

Reverberation time RT is the time after which the sound pressure in the room after switching the source off falls to one thousandth of the value before switching off the source. This corresponds to a decrease in sound level by 60 dB. This is the most important parameter of room acoustics. Based on the sound level decay curve, parameters such as clarity, definition, spatiality, volume and color are determined.

6.2 Sound pressure level SPL

The sound pressure level (SPL) is a logarithmic measure of the strength of sound. It is defined as 20 logarithms of the ratio of the effective sound pressure value and the threshold of hearing by healthy human for frequency of 1000 Hz, which is assumed to be 20 Pa. The sound pressure level is expressed in decibels. Its values are between 0 dB (threshold of hearing) and 130 dB (threshold of pain). Humans distinguish level changes by about 1 dB.

6.3 Speech transmission index STI

Speech transmission index is a measure of the speech quality between speaker and listener. The higher STI values are, the better is the speech intelligibility. Table 1 presents the STI values and corresponding speech intelligibility.

<table>
<thead>
<tr>
<th>STI [%]</th>
<th>Rating scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 32</td>
<td>Bad (speech generally not intelligible)</td>
</tr>
<tr>
<td>32 - 45</td>
<td>Poor (speech poorly intelligible)</td>
</tr>
<tr>
<td>45 - 60</td>
<td>Fair (speech intelligible with disturbing distortions)</td>
</tr>
<tr>
<td>60 - 75</td>
<td>Good (distortions perceived, but not disturbing)</td>
</tr>
<tr>
<td>75 - 100</td>
<td>Excellent (distortions not perceived)</td>
</tr>
</tbody>
</table>

The measurement was done in two types of conditions;

a) The measuring device not isolated against influence of water veins. The results are presented in Fig. 6.

b) The measuring device not isolated against influence of water veins with using aluminum plate. The results are presented in Fig. 7.
7. COMPARISON OF RESULTS WITH AND WITHOUT INFLUENCE OF WATER VEINS

Fig. 8 shows the results of the reverberation time measurement obtained under the conditions of the influence of water veins and under interception of this influence.

![Fig. 8. The reverberation time under conditions with and without influence of water veins](image)

The mean reverberation time with the influence of the water vein is 0.83 s and the mean value with the removed effect is 0.76 s. The relative difference in both reverberation times is about 10% and it is statistically significant.

In the Fig. 9 the parameter D50 (definition) is presented with present influence of water veins and with interrupted influence. The parameter D50 is correlated with STI.

![Fig. 9. The definition D50 measured under conditions with and without influence of water veins](image)

The average value of D50 with water vein is 71.5% and average D50 with interception of water veins is equal to 69.2%. The difference is equal to 2.3 %.

Last analyzed parameter is pw-50 ms. This parameter is measured in decibels. The results of measurement are presented in Fig. 10.

![Fig. 10. The parameter pw-50 ms measured under conditions with and without influence of water veins](image)

The Pw 50 ms measured for present water vein has average value -1.45 dB and it is higher than the Pw 50 ms value with interception of water veins which is equal to -1.60 dB.

8. REFERENCES


