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Determine the dempfirmation coefficient and the private vibration frequency from the resonance curve.

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Abstract:. The mandatory vertical distortions of the foundations were investigated by V.I.Ilichev, D.D. Barkans based on experiments. Based on the experiments, written by D.D. Barkan and B.M.Mardonov, "The theorem of the theorems is based on the current history of the world, for more information, please first appear in the article "The Bible's Viewpoint: How Can I Make Bible Teaching Enjoyable?"
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We know that the differential equation of vertical forced vibrations of the foundation has the following view:1]:

$$\frac{d^2z}{dt^2}+2n\frac{dz}{dt}+\lambda^2 z=\rho\omega^2\sin\omega t \qquad (1)$$

In this case n-dempfirmation coefficient, λ-private vibration frequency, $\rho\omega^2$- vibration amplitude, ρ -cited eccentrithy, ω- compulsory vibration frequency.

The mandatory vertical distortions of the foundations were investigated by V.I.Ilichev, D.D. Barkans based on experiments. Based on the experiments, written by D.D. Barkan and B.M.Mardonov, "The theorem of the theorems is based on the current history of the world, for more information, please first appear in the article "The Bible's Viewpoint: How Can I Make Bible Teaching Enjoyable?" [2] Authors $Q_0\varepsilon=3{,}36\,Nm;\ v_s=140\,m/s;$ in the resonance equation at values, n, λ- theoretical coefficients $\beta_n=1{,}24;\ \lambda_n=216;\ n_n=78{,}5;$ and based on experience, $\beta_t=1{,}57;\ \lambda_t=162;\ n_t=29{,}6;$ rezanans curve for values

$$A=\frac{Q_0\varepsilon}{Q\beta}\frac{w^2}{\sqrt{(\lambda^2-w^2)^2+4n^2w^2}} \qquad (2)$$

based on the formula and the following result was obtained (Figure 1)

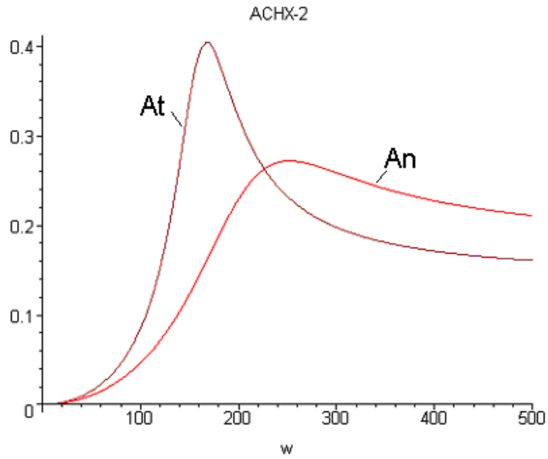

Figure 1.

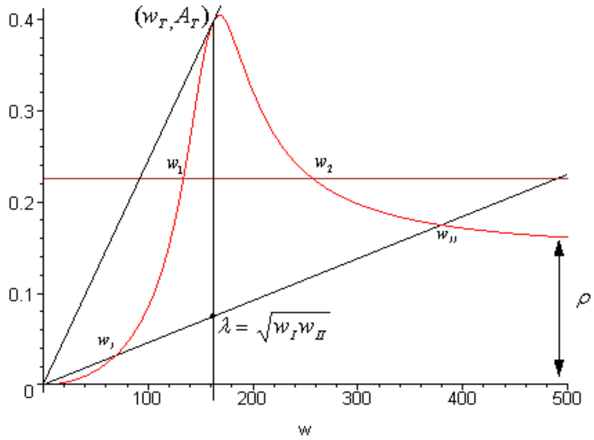

Figure 2.

In this article, when you are given a resonance curve A_t built on the experiments in Figure 1, use it

$$w^4(A^2-\rho^2)-2(wA)^2(\lambda^2-2n^2)+A^2\lambda^4=0 \quad (3)$$

in the resonance equation n, λ ρ the issue of determining coefficients is raised.

To do this, the coordinate is given from the beginning and in Form 1 A_t crossing the resonance curve $A=kw$ we conduct straight lines. Each straight line intersection points passed w_I, w_{II} and their medium geometeination $\lambda=\sqrt{w_I w_{II}}$ for Table 1.

Table 1

lines	1	2	3	4	5	6
w_I	70	88	100	120	130	142
w_{II}	380	300	260	220	200	180
$\lambda=\sqrt{w_I w_{II}}$	163	162.48	161.25	162.48	161.25	160

λ Describing the defined values in a graphic, we attach them and see that the resonance curve is made up of a skilet (maximum line), i.e. a private vibration frequency $\lambda=161{,}74$, consisting of a straight line. To determine the presented excentricity ρ and dempfirmation coefficient n, we cross the graph and cross parallel to the absissa arrow $A=0.18$ and $A=0.225$ (Figure 2) straight lines, w_1, λ, w_2 the intersection points (3) are the solution to the equation

$$w_{1,2}^2=\frac{\lambda^2-2n^2\pm\sqrt{(\lambda^2-2n^2)^2-\lambda^4\left(1-\frac{\rho^2}{A^2}\right)}}{1-\frac{\rho^2}{A^2}} \quad (4)$$

Insert it into n, ρ - we have two unknown systems of equations relative to the larynks, remove it and produce the following expressions;

$$n=\lambda\sqrt{\frac{1}{2}-\frac{\lambda^2\left(w_1^2+w_2^2\right)}{4w_1^2w_2^2}};\quad \rho=A\sqrt{1-\frac{\lambda^4}{w_1^2w_2^2}}; \quad (5)$$

Determine the values for each line A, w_1, λ, w_2 (5) and fill in Table 2 based on the expression

Table 2

ay/s A[mk]	w_1	w_2	λ	ρ	n
0.18	125	380	161.74	0.1503	30.753
0.225	132	260	161.74	0.1458	27.022
				0.14805	28.888

the dempfirmation coefficient n can be more accurately determined by the following formula;

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$$n = \frac{\rho}{2\frac{A_T}{w_T}} \qquad (6)$$

in this case w_T, A_T - the coordinate of the $A = kw$ hitting point of a straight line that attempts the beginning of the coordinate and the
resonance curve.We determine the dempfirmation coefficient (6) based on the formula

$$n = \frac{w_T \cdot \rho}{2 \cdot A_T} = \frac{0.14805 \cdot 161{,}74}{2 \cdot 0.4} = 29{,}93;$$

Identified from the experiment and identified from the rezanans curve n, λ, ρ -we put the coefficients (3) in the equation and have the following graphic

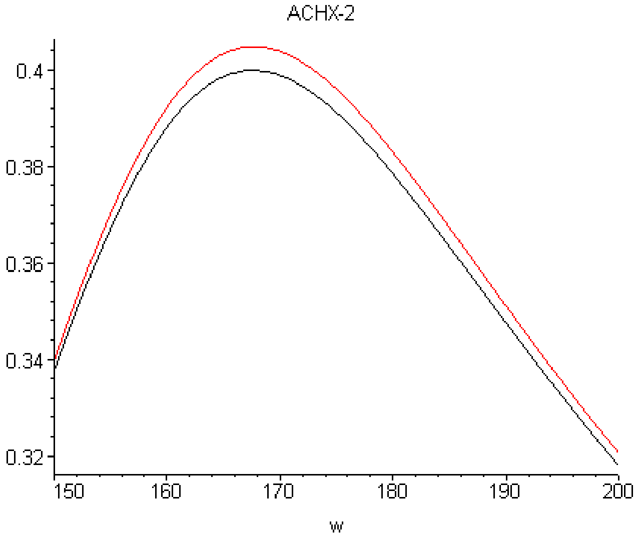

Figure 3.

When given values and resonance curve $\beta_t = 1{,}57$; $\lambda_t = 162$; $n_t = 29{,}6$ obtained based on experiments, it is determined using it $\rho = 0.14805$; $n_t = 29{,}93$;

$\lambda_t = 161{,}74$ - we compare the coefficients. As a result of the comparison, the dempfirmation coefficient was 1.1%, and the resonance curve (Figure 3) was determined by an error of 1,123%.

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