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The work aim is to assess the admissibility of a number of components of the calculated perturbations to predict the dynamic qualities of the freight cars in a vertical plane. In the research methods of mathematical modelling have been employed.

Three groups of the calculated disturbances are examined. The first group deals with a polyharmonic model whose parameters are determined analyzing irregularities in the areas of the main track of the Pridneprovsk Railways. The second group of disturbances is formed by the formulas and tables from a Handbook on Calculating Irregularities of Railway Track. Irregularities of the software package "Universal Mechanism" present the third group. A level of components of those disturbances is analysed and the normalized factors of dynamic qualities of empty and loaded open wagons in a wide range of speeds are computed. Conclusions on the serviceability of disturbances considered for predictions are made comparing assessments of factors and the corresponding experimental data.

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-
(η_r^v η_l^v);   .
-
                                              η_{sym}
η_r^v η_l^v . η_{sk-sym} -
                                                                                          η_r^v
η_l^v .
                                                                                          -
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.   [2, 3]   -
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:

$$B(x) = \sum_{i=1}^{N} b_i \cdot \sin\left(2\pi \cdot x / L_i\right), \qquad (1)$$

b_i L_i , $i = \overline{1,N}$ –   -
; N –   .
L_i b_i
,   .   -
                                                                                          -
,
,   ,
                                                                                          N
                  8, b_i L_i ($i = \overline{1,8}$) –   ,   -
. 1.

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B,

b_{sym} b_{sk-sym}.

1

	L_i,	b_i,
b_{sym}	40,0	4,8
	17,0	1,5
	6,0	0,6
	5,0	0,6
	4,1	0,4
	3,3	0,4
	2,3	0,2
	1,1	0,1
b_{sk-sym}	33,0	2,8
	17,0	1,2
	8,2	1,1
	6,2	1,3
	5,0	0,6
	3,7	0,3
	1,9	0,6
	1,1	0,1

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32.68 96 (   ),

[4].

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$$\eta_{ij}(t) = \frac{h_{0j}}{2}\left(1 - \cos\left(\frac{2\pi}{L}t*\right)\right), \qquad (2)$$

$i = 1, 2, 3, 4 -$ j -   ; $j = 1, 2 -$
; $t -$; $h_{0j} -$; $L -$
; $t* = t + (l_T + l)/V$ $i = 1$; $t* = t + l/V$ $i = 2$;
$t* = t + l_T / V$ $i = 3$; $t* = t$ $i = 4$; $0 \le t \le n(l_T + l)/V$; $l_T -$
; $l -$; $V -$; $n -$
.

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x -

:

$$\eta_j(x) = \frac{h_{0j}}{2}\left(1 - \cos \omega x\right), \qquad (3)$$

$\omega = 2\pi / L$ – .

(-

$\eta_0^{\text{в}}$ $\eta_0^{\text{пер}}$) -

« – »

120 / , [4],

. 2.

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		L ,		
	$L < 10$	$L = 10$	$L = 20$	$L > 20$
- $\eta_0^{\text{в}}$	16	18	20	24
$\eta_0^{\text{пер}}$	12	14	20	-

, -
-
, η_{sym} -

(3) $h_{0j} = \eta_0^{\text{в}}$. 2, η_{sk-sym} – $h_{0j} = \eta_0^{\text{пер}}$.

, (3) -
. 2, Ru, -
$ru_{sym}(L)$ $ru_{sk-sym}(L)$, L –

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L « 10» « 20»

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: « 10» – 5 , « 20» – 30 . , ,

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                        «   » (UM) [5]   -
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                    .   *uic-good-vert-left.way*,   *uic-good-vert-right.way*,   *uic-bad-vert-*
left.way   *uic-bad-vert-right.way*

                                                                                        .   -
                                                                                                                     -
                                                                            Uic-good   *Uic-*
bad.   *Uic-good*$_{sym}$,   *Uic-good*$_{sk-sym}$,

Uic-bad$_{sym}$ *Uic-bad*$_{sk-sym}$.

                                                            . 1,   –   . 2.   -
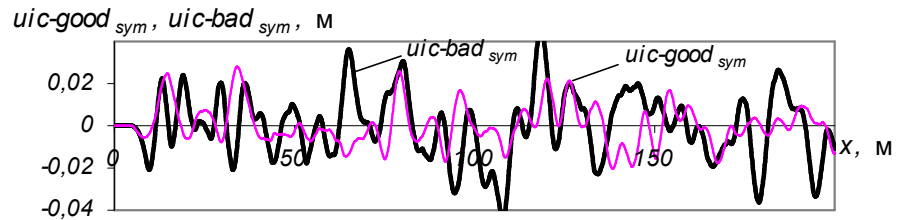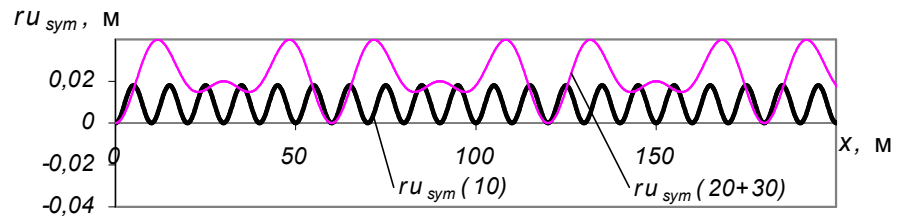   *Ru*
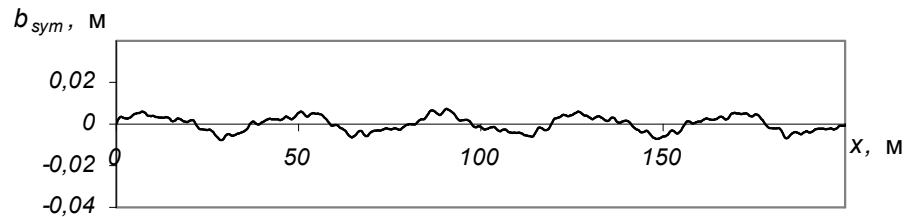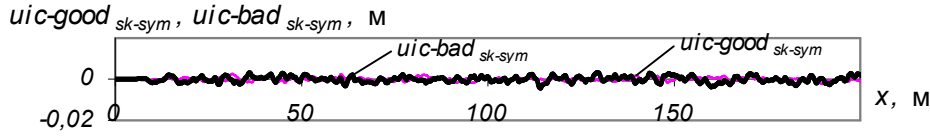$ru_{sym}(10)$,   (3)   . 2
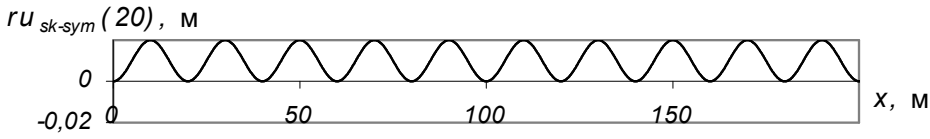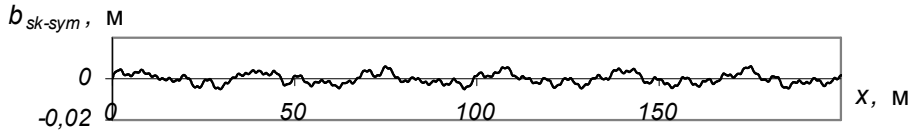$L = 10$, $ru_{sym}(20 + 30)$,
                                    $L_1 = 20$ $L_2 = 30$,
$ru_{sk-sym}(20)$, $L = 20$.

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b_{sk-sym}, м

ru_{sk-sym} (20) , м

$uic\text{-}good_{sk-sym}$, $uic\text{-}bad_{sk-sym}$, м

$uic\text{-}bad_{sk-sym}$ $uic\text{-}good_{sk-sym}$

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                                    (   ),   -
          ,   . 3.

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		,	,
B	b_{sym}	15,6	3,7
	b_{sk-sym}	13,4	2,5
Ru	$ru_{sym}(5)$	16,0	5,7
	$ru_{sk-sym}(5)$	12,0	4,3
	$ru_{sym}(10)$	18,0	6,4
	$ru_{sk-sym}(10)$	14,0	5,0
	$ru_{sym}(20)$	20,0	7,1
	$ru_{sk-sym}(20)$	20,0	7,1
	$ru_{sym}(30)$	24,0	8,5
	$ru_{sym}(20+30)$	39,9	11,0
Uic-good	$Uic\text{-}good_{sym}$	56,2	9,8
	$Uic\text{-}good_{sk-sym}$	5,3	0,9
Uic-bad	$Uic\text{-}bad_{sym}$	94,6	15,7
	$Uic\text{-}bad_{sk-sym}$	8,9	1,4

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                          Ru (
$ru_{sym}(20+30)$,   )   -

B, ,   ,   -
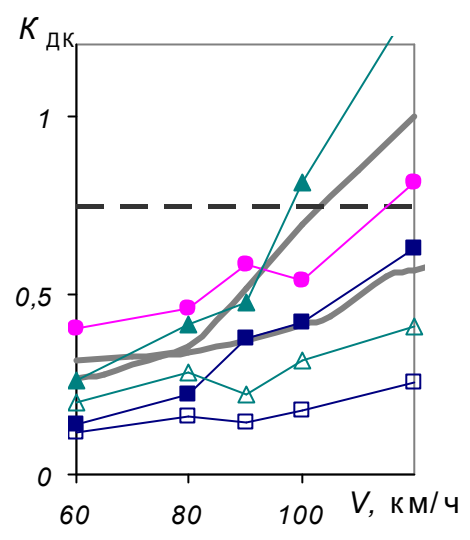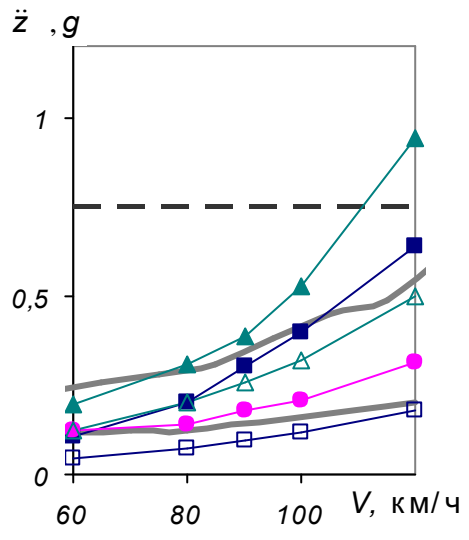   -
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Ru, b_{sym} b_{sk-sym} -
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Ru (   )   1,4–2,8
                                                            B.
Uic-good   *Uic-bad*   *B*   *Ru*
(,
)   –   .
.   *B, Ru, Uic-good*
Uic-bad
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                                          ,
                              – $\ddot{z}$
                                          K   .

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                              B   -
[1, 2],   .
                    Ru, Uic-good   *Uic-bad*   ,

                                                            UM   .
                                                    Ru   ,   -
$ru_{sk-sym}(5)$, $ru_{sk-sym}(10)$ $ru_{sk-sym}(20)$
                                                            ,
                                          ,   «   -
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                                                    Ru,   -
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    $ru_{sym}(30)$ $ru_{sym}(20)$ (. .   30
20)   -
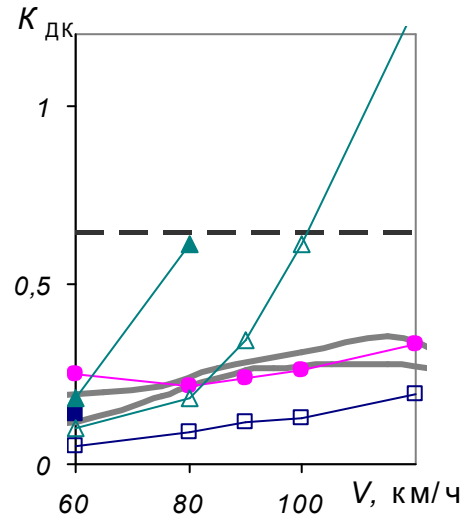   -
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    [3],   ,   -
                    (30   20)
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96

, $ru_{sym}(5)$ (. . -

5) $V = 80$ / $\ddot{z}$ K -

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$\ddot{z}$ K -

V

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B, ■ – -

$ru_{sym}(10)$, □ – $ru_{sym}(20+30)$, ▲ – Uic-

bad, △ – Uic-$good$.

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ż ,g   К дк

V, км/ч   V, км/ч
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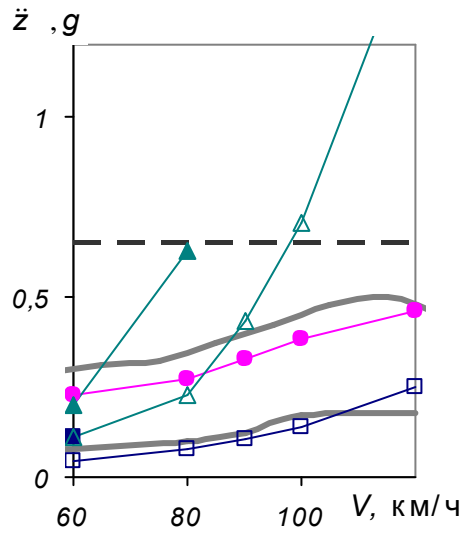
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ru _sym_(10) (. .   10),

–   ru _sym_(20 + 30) (

20   30).

ru _sym_(10)

80   /

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ru _sym_(20 + 30) ,   ,

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Uic-good

Uic-bad   ż   К

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Uic-good   Uic-bad,

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Uic-bad

80   / ,

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UM,

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Uic-good   *Uic-bad*
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•   *В*

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Ru,   [4],   -
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UM,   -
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Uic-good   *Uic-bad*   -
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