FACTA UNIVERSITATIS
Series: **Mechanical Engineering** Vol.1, N° 7, 2000, pp. 901 - 910

ANALYTICAL DEFINITION OF PROBABILITY OF INFLUENCE OF "$T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g$" SYSTEM CHARACTERISTIC PARAMETER p_f TO VALVE RESPONSE TIME Tzi

UDC 519.87

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Abstract. *This paper presents an original way for definition of the analytical expressions for partial correlation coefficient $r_{i6\cdot12345}$ and characteristic partial correlation coefficients of functional relationship in the form $T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g$ for qualitative estimation of harmonization between the theoretically obtained model and experimentally obtained data for T_{zi}. Partial correlation coefficient $r_{i6\cdot12345}$ of functional relationship $T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g$, expressed by the linear regression equations set, that is, via the matrix of the system, defines the probability of influence of system characteristic parameter p_f to the response time T_{zi} of the similar valves in the case when the other system characteristic parameters remain constant.*

Key words: *Valves, mathematical modeling, valve response time, model qualitative estimation, probability of influence, characteristic correlation coefficients.*

1. GOALS OF RESEARCH

This article is an extension of the previous papers [1 to 14] made by the same author. This work is dealing with a method for analytical definition of the probability of influence of the $T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g$ system characteristic parameter p_f to the similar valves response times.

The main goal of research is to exploit the characteristic partial correlation coefficient $r_{i6\cdot12345}$ of the functional relationship, in the form:

$$T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g \tag{1}$$

in order to define analytically the probability of influence of characteristic parameter p_f to the similar valves response times with respect to the nominal value of the system (1)

Received August 15, 2000
Presented at 5th YUSNM Niš 2000, Nonlinear Sciences at the Threshold of the Third Millenium, October 2-5, 2000, Faculty of Mechanical Engineering University of Niš

characteristic parameter p_f, all for the case when the other system characteristic parameters ($r,\gamma,\delta,\varphi,\alpha$) are constant.

2. PARTIAL CORRELATION COEFFICIENT $r_{i6\cdot12345}$ OF THE FUNCTIONAL RELATIONSHIP $T_{zi} = Ar_1^a\gamma_2^b\delta_3^c\varphi_4^d\alpha_5^e p_{f6}^g$

The partial correlation coefficient $r_{i6\cdot12345}$ of the functional relationship (1) defines the level of agreement between the dependent variable T_{zi} and independent parameter p_f, when the other independent parameters ($r,\gamma,\delta,\varphi,\alpha$) are presumed to be constant.

The probability of influence of the system (1) characteristic parameter p_f to the valve response time T_{zi}, for the case when the system (1) other characteristic parameters ($r,\gamma,\delta,\varphi,\alpha$) remain constant, can analytically be defined by the partial correlation coefficient $r_{i6\cdot12345}$ for the functional relationship (1).

The partial correlation coefficient $r_{i6\cdot12345}$ is defined by the analytical expression:

$$r_{i6\cdot12345} = \frac{r_{i6\cdot2345} - r_{i1\cdot2345}r_{61\cdot2345}}{\sqrt{(1-r_{i1\cdot2345}^2)(1-r_{61\cdot2345}^2)}} \tag{2}$$

2.1. Partial correlation coefficients $r_{i6\cdot2345}$, $r_{i1\cdot2345}$ and $r_{61\cdot2345}$

The partial correlation coefficients $r_{i6\cdot2345}$, $r_{i1\cdot2345}$ and $r_{61\cdot2345}$ existing in expression (2), can be defined by the following analytical expressions:

$$r_{i6\cdot2345} = \frac{r_{i6\cdot345} - r_{i2\cdot345}r_{62\cdot345}}{\sqrt{(1-r_{i2\cdot345}^2)(1-r_{62\cdot345}^2)}} \tag{3}$$

$$r_{i1\cdot2345} = \frac{r_{i1\cdot345} - r_{i2\cdot345}r_{12\cdot345}}{\sqrt{(1-r_{i2\cdot345}^2)(1-r_{12\cdot345}^2)}} \tag{4}$$

$$r_{61\cdot2345} = \frac{r_{61\cdot345} - r_{62\cdot345}r_{12\cdot345}}{\sqrt{(1-r_{62\cdot345}^2)(1-r_{12\cdot345}^2)}} \tag{5}$$

2.2. Partial correlation coefficients $r_{i6\cdot345}$, $r_{i2\cdot345}$ and $r_{62\cdot345}$

The partial correlation coefficients $r_{i6\cdot345}$, $r_{i2\cdot345}$ and $r_{i62\cdot345}$, existing in expression (3) can be defined by the following analyitical expressions:

$$r_{i6\cdot345} = \frac{r_{i6\cdot45} - r_{i3\cdot45}r_{63\cdot45}}{\sqrt{(1-r_{i3\cdot45}^2)(1-r_{63\cdot45}^2)}} \tag{6}$$

$$r_{i2\cdot345} = \frac{r_{i2\cdot45} - r_{i3\cdot45}r_{23\cdot45}}{\sqrt{(1-r_{i3\cdot45}^2)(1-r_{23\cdot45}^2)}} \tag{7}$$

$$r_{62\cdot345} = \frac{r_{62\cdot45} - r_{63\cdot45}r_{23\cdot45}}{\sqrt{(1-r_{63\cdot45}^2)(1-r_{23\cdot45}^2)}} \tag{8}$$

2.3. Partial correlation coefficients $r_{i1\cdot345}$ and $r_{12\cdot345}$

The partial correlation coefficients $r_{i1\cdot345}$ and $r_{i12\cdot345}$, existing in expression (4) can be defined by the following analyitical expressions:

$$r_{i1\cdot345} = \frac{r_{i1\cdot45} - r_{i3\cdot45} r_{13\cdot45}}{\sqrt{(1 - r_{i3\cdot45}^2)(1 - r_{13\cdot45}^2)}} \tag{9}$$

$$r_{12\cdot345} = \frac{r_{12\cdot45} - r_{13\cdot45} r_{23\cdot45}}{\sqrt{(1 - r_{13\cdot45}^2)(1 - r_{23\cdot45}^2)}} \tag{10}$$

2.4. Partial correlation coefficient $r_{61\cdot345}$

The partial correlation coefficient $r_{i61\cdot345}$, existing in expression (5) can be defined by the following analytical expression:

$$r_{61\cdot345} = \frac{r_{61\cdot45} - r_{63\cdot45} r_{13\cdot45}}{\sqrt{(1 - r_{63\cdot45}^2)(1 - r_{13\cdot45}^2)}} \tag{11}$$

2.5. Partial correlation coefficients $r_{i6\cdot45}$, $r_{i3\cdot45}$ and $r_{63\cdot45}$

The partial correlation coefficients $r_{i6\cdot45}$, $r_{i3\cdot45}$ and $r_{i63\cdot45}$, existing in expression (6) can be defined by the following analytical expressions:

$$r_{i6\cdot45} = \frac{r_{i6\cdot5} - r_{i4\cdot5} r_{64\cdot5}}{\sqrt{(1 - r_{i4\cdot5}^2)(1 - r_{64\cdot5}^2)}} \tag{12}$$

$$r_{i3\cdot45} = \frac{r_{i3\cdot5} - r_{i4\cdot5} r_{34\cdot5}}{\sqrt{(1 - r_{i4\cdot5}^2)(1 - r_{34\cdot5}^2)}} \tag{13}$$

$$r_{63\cdot45} = \frac{r_{63\cdot5} - r_{64\cdot5} r_{34\cdot5}}{\sqrt{(1 - r_{64\cdot5}^2)(1 - r_{34\cdot5}^2)}} \tag{14}$$

2.6. Partial correlation coefficients $r_{i2\cdot45}$ and $r_{23\cdot45}$

The partial correlation coefficients $r_{i2\cdot45}$ and $r_{23\cdot45}$, existing in expression (7) can be defined by the following analytical expressions:

$$r_{i2\cdot45} = \frac{r_{i2\cdot5} - r_{i4\cdot5} r_{24\cdot5}}{\sqrt{(1 - r_{i4\cdot5}^2)(1 - r_{24\cdot5}^2)}} \tag{15}$$

$$r_{23\cdot45} = \frac{r_{23\cdot5} - r_{24\cdot5} r_{34\cdot5}}{\sqrt{(1 - r_{24\cdot5}^2)(1 - r_{34\cdot5}^2)}} \tag{16}$$

2.7. Partial correlation coefficient $r_{62\cdot45}$

The partial correlation coefficient $r_{i62\cdot45}$, existing in expression (8) can be defined by the following analytical expression:

$$r_{62\cdot45} = \frac{r_{62\cdot5} - r_{64\cdot5}r_{24\cdot5}}{\sqrt{(1-r_{64\cdot5}^2)(1-r_{24\cdot5}^2)}} \tag{17}$$

2.8. Partial correlation coefficients $r_{i1\cdot45}$ and $r_{13\cdot45}$

The partial correlation coefficients $r_{i1\cdot45}$ and $r_{13\cdot45}$, existing in expression (9) can be defined by the following analytical expressions:

$$r_{i1\cdot45} = \frac{r_{i1\cdot5} - r_{i4\cdot5}r_{14\cdot5}}{\sqrt{(1-r_{i4\cdot5}^2)(1-r_{14\cdot5}^2)}} \tag{18}$$

$$r_{13\cdot45} = \frac{r_{13\cdot5} - r_{14\cdot5}r_{34\cdot5}}{\sqrt{(1-r_{14\cdot5}^2)(1-r_{34\cdot5}^2)}} \tag{19}$$

2.9. Partial correlation coefficient $r_{12\cdot45}$

The partial correlation coefficient $r_{12\cdot45}$, existing in expression (10) can be defined by the following analytical expression:

$$r_{12\cdot45} = \frac{r_{12\cdot5} - r_{14\cdot5}r_{24\cdot5}}{\sqrt{(1-r_{14\cdot5}^2)(1-r_{24\cdot5}^2)}} \tag{20}$$

2.10. Partial correlation coefficient $r_{61\cdot45}$

The partial correlation coefficient $r_{61\cdot45}$, existing in expression (11) can be defined by the following analytical expression:

$$r_{61\cdot45} = \frac{r_{61\cdot5} - r_{64\cdot5}r_{14\cdot5}}{\sqrt{(1-r_{64\cdot5}^2)(1-r_{14\cdot5}^2)}} \tag{21}$$

2.11. Partial correlation coefficients $r_{i6\cdot5}$, $r_{i4\cdot5}$ and $r_{64\cdot5}$

The partial correlation coefficients $r_{i6\cdot5}$, $r_{i4\cdot5}$ and $r_{64\cdot5}$, existing in expression (12) can be defined by the following analytical expressions:

$$r_{i6\cdot5} = \frac{r_{i6} - r_{i5}r_{65}}{\sqrt{(1-r_{i5}^2)(1-r_{65}^2)}} \tag{22}$$

$$r_{i4\cdot5} = \frac{r_{i4} - r_{i5}r_{45}}{\sqrt{(1-r_{i5}^2)(1-r_{45}^2)}} \tag{23}$$

$$r_{64\cdot5} = \frac{r_{64} - r_{65}r_{45}}{\sqrt{(1-r_{65}^2)(1-r_{45}^2)}} \tag{24}$$

2.12. Partial correlation coefficients $r_{i3\cdot5}$ and $r_{34\cdot5}$

The partial correlation coefficients $r_{i3\cdot5}$ and $r_{34\cdot5}$, existing in expression (13) can be defined by the following analytical expressions:

$$r_{i3\cdot5} = \frac{r_{i3} - r_{i5}r_{35}}{\sqrt{(1-r_{i5}^2)(1-r_{35}^2)}} \tag{25}$$

$$r_{34\cdot5} = \frac{r_{34} - r_{35}r_{45}}{\sqrt{(1-r_{35}^2)(1-r_{45}^2)}} \tag{26}$$

2.13. Partial correlation coefficient $r_{63\cdot5}$

The partial correlation coefficient $r_{63\cdot5}$ existing in expression (14) can be defined by the following analytical expression:

$$r_{63\cdot5} = \frac{r_{63} - r_{65}r_{35}}{\sqrt{(1-r_{65}^2)(1-r_{35}^2)}} \tag{27}$$

2.14. Partial correlation coefficients $r_{i2\cdot5}$ and $r_{24\cdot5}$

The partial correlation coefficients $r_{i2\cdot5}$ and $r_{24\cdot5}$, existing in expression (15) can be defined by the following analytical expressions:

$$r_{i2\cdot5} = \frac{r_{i2} - r_{i5}r_{25}}{\sqrt{(1-r_{i5}^2)(1-r_{25}^2)}} \tag{28}$$

$$r_{24\cdot5} = \frac{r_{24} - r_{25}r_{45}}{\sqrt{(1-r_{25}^2)(1-r_{45}^2)}} \tag{29}$$

2.15. Partial correlation coefficient $r_{23\cdot5}$

The partial correlation coefficient $r_{23\cdot5}$ existing in expression (16) can be defined by the following analytical expression:

$$r_{23\cdot5} = \frac{r_{23} - r_{23}r_{35}}{\sqrt{(1-r_{25}^2)(1-r_{35}^2)}} \tag{30}$$

2.16. Partial correlation coefficient $r_{62\cdot5}$

The partial correlation coefficient $r_{62\cdot5}$, existing in expression (17) can be defined by the following analytical expression:

$$r_{62\cdot5} = \frac{r_{62} - r_{65}r_{25}}{\sqrt{(1-r_{65}^2)(1-r_{25}^2)}} \tag{31}$$

2.17. Partial correlation coefficients $r_{i1\cdot5}$ and $r_{14\cdot5}$

The partial correlation coefficients $r_{i1\cdot5}$ and $r_{14\cdot5}$, existing in expression (18) can be defined by the following analytical expressions:

$$r_{i1\cdot5} = \frac{r_{i1} - r_{i5}r_{15}}{\sqrt{(1-r_{15}^2)(1-r_{15}^2)}} \quad (32)$$

$$r_{14\cdot5} = \frac{r_{14} - r_{15}r_{45}}{\sqrt{(1-r_{15}^2)(1-r_{45}^2)}} \quad (33)$$

2.18. Partial correlation coefficient $r_{13\cdot5}$

The partial correlation coefficient $r_{13\cdot5}$, existing in expression (19) can be defined by the following analytical expression:

$$r_{13\cdot5} = \frac{r_{13} - r_{15}r_{35}}{\sqrt{(1-r_{15}^2)(1-r_{35}^2)}} \quad (34)$$

2.19. Partial correlation coefficient $r_{12\cdot5}$

The partial correlation coefficient $r_{12\cdot5}$, existing in expression (20) can be defined by the following analytical expression:

$$r_{12\cdot5} = \frac{r_{12} - r_{15}r_{25}}{\sqrt{(1-r_{15}^2)(1-r_{25}^2)}} \quad (35)$$

2.20. Partial correlation coefficient $r_{61\cdot5}$

The partial correlation coefficient $r_{61\cdot5}$, existing in expression (21) can be defined by the following analytical expression:

$$r_{61\cdot5} = \frac{r_{61} - r_{65}r_{15}}{\sqrt{(1-r_{65}^2)(1-r_{15}^2)}} \quad (36)$$

2.21. Partial correlation coefficients r_{i5}, r_{i6} and r_{65}

The partial correlation coefficients r_{i5}, r_{i6} and r_{65}, existing in expression (22) can be defined by the analytical expressions (46), from [4] and [14]:

$$r_{i5} = \frac{\Sigma X_{5i} Y_i}{\sqrt{(\Sigma X_{5i}^2)(\Sigma Y_i^2)}} = \frac{B(5)}{\sqrt{X(5,5)C(0)}} \quad (37)$$

$$r_{i6} = \frac{\Sigma X_{6i} Y_i}{\sqrt{(\Sigma X_{6i}^2)(\Sigma Y_i^2)}} = \frac{B(6)}{\sqrt{X(6,6)C(0)}} \quad (38)$$

$$r_{65} = \frac{\Sigma X_{6i} X_{5i}}{\sqrt{(\Sigma X_{6i}^2)(\Sigma X_{5i}^2)}} = \frac{X(6,5)}{\sqrt{X(6,6)X(5,5)}} \quad (39)$$

2.22. Partial correlation coefficients r_{i4} and r_{45}

The partial correlation coefficients r_{i4} and r_{45}, existing in expression (23) can be defined by the analytical expressions (45) and (55) from [4], respectively.

2.23. Partial correlation coefficient r_{64}

The partial correlation coefficient r_{64}, existing in expression (24) can be defined by the analytical expression:

$$r_{64} = \frac{\Sigma X_{6i} X_{4i}}{\sqrt{(\Sigma X_{6i}^2)(\Sigma X_{4i}^2)}} = \frac{X(6,4)}{\sqrt{X(6,6)X(4,4)}} \tag{40}$$

2.24. Partial correlation coefficients r_{i3} and r_{35}

The partial correlation coefficients r_{i3} and r_{35}, existing in expression (25) can be defined by the analytical expressions (44) and (54), from [4]:

$$r_{i3} = \frac{\Sigma X_{3i} Y_i}{\sqrt{(\Sigma X_{3i}^2)(\Sigma Y_i^2)}} = \frac{B(3)}{\sqrt{X(3,3)C(0)}} \tag{41}$$

$$r_{35} = \frac{\Sigma X_{3i} X_{5i}}{\sqrt{(\Sigma X_{3i}^2)(\Sigma X_{5i}^2)}} = \frac{X(3,5)}{\sqrt{X(3,3)X(5,5)}} \tag{42}$$

2.25. Partial correlation coefficient r_{34}

The partial correlation coefficient r_{34}, existing in expression (26) can be defined by the analytical expression (52), from [4]:

$$r_{34} = \frac{\Sigma X_{3i} X_{4i}}{\sqrt{(\Sigma X_{3i}^2)(\Sigma X_{4i}^2)}} = \frac{X(3,4)}{\sqrt{X(3,3)X(4,4)}} \tag{43}$$

2.26. Partial correlation coefficient r_{63}

The partial correlation coefficient r_{63}, existing in expression (27) can be defined by the following analytical expression:

$$r_{63} = \frac{\Sigma X_{6i} X_{3i}}{\sqrt{(\Sigma X_{6i}^2)(\Sigma X_{3i}^2)}} = \frac{X(6,3)}{\sqrt{X(6,6)X(3,3)}} \tag{44}$$

2.27. Partial correlation coefficients r_{i2} and r_{25}

The partial correlation coefficients r_{i2} and r_{25}, existing in expression (28) can be defined by the following analytical expressions:

$$r_{i2} = \frac{\Sigma X_{2i} Y_i}{\sqrt{(\Sigma X_{2i}^2)(\Sigma Y_i^2)}} = \frac{B(2)}{\sqrt{X(2,2)C(0)}} \tag{45}$$

$$r_{25} = \frac{\Sigma X_{2i} X_{5i}}{\sqrt{(\Sigma X_{2i}^2)(\Sigma X_{5i}^2)}} = \frac{X(2,5)}{\sqrt{X(2,2)X(5,5)}} \tag{46}$$

2.28. Partial correlation coefficient r_{24}

The partial correlation coefficient r_{24}, existing in expression (29) can be defined by the following analytical expression:

$$r_{24} = \frac{\Sigma X_{2i} X_{4i}}{\sqrt{(\Sigma X_{2i}^2)(\Sigma X_{4i}^2)}} = \frac{X(2,4)}{\sqrt{X(2,2)X(4,4)}} \tag{47}$$

2.29. Partial correlation coefficient r_{23}

The partial correlation coefficient r_{23}, existing in expression (30) can be defined by the following analytical expression:

$$r_{23} = \frac{\Sigma X_{2i} X_{3i}}{\sqrt{(\Sigma X_{2i}^2)(\Sigma X_{3i}^2)}} = \frac{X(2,3)}{\sqrt{X(2,2)X(3,3)}} \tag{48}$$

2.30. Partial correlation coefficient r_{62}

The partial correlation coefficient r_{62}, existing in expression (31) can be defined by the following analytical expression:

$$r_{62} = \frac{\Sigma X_{6i} X_{2i}}{\sqrt{(\Sigma X_{6i}^2)(\Sigma X_{2i}^2)}} = \frac{X(6,2)}{\sqrt{X(6,6)X(2,2)}} \tag{49}$$

2.31. Partial correlation coefficient r_{i1}, r_{15}, r_{14}, r_{13}, r_{12} and r_{61}

The partial correlation coefficients r_{i1} and r_{15}, existing in expression (32) can be defined by the following analytical expression:

$$r_{i1} = \frac{\Sigma X_{1i} Y_i}{\sqrt{(\Sigma X_{1i}^2)(\Sigma Y_i^2)}} = \frac{B(1)}{\sqrt{X(1,1)C(0)}} \tag{50}$$

$$r_{15} = \frac{\Sigma X_{1i} X_{5i}}{\sqrt{(\Sigma X_{1i}^2)(\Sigma X_{5i}^2)}} = \frac{X(1,5)}{\sqrt{X(1,1)X(5,5)}} \tag{51}$$

The partial correlation coefficients r_{14}, r_{13}, r_{12} and r_{61}, existing in expression (33), (34), (35) and (36) can be defined by the analytical expressions (49), (48), (47), from [4] and [14]:

$$r_{14} = \frac{\Sigma X_{1i} X_{4i}}{\sqrt{(\Sigma X_{1i}^2)(\Sigma X_{4i}^2)}} = \frac{X(1,4)}{\sqrt{X(1,1)X(4,4)}} \tag{52}$$

$$r_{13} = \frac{\Sigma X_{1i} X_{3i}}{\sqrt{(\Sigma X_{1i}^2)(\Sigma X_{3i}^2)}} = \frac{X(1,3)}{\sqrt{X(1,1)X(3,3)}} \tag{53}$$

$$r_{12} = \frac{\Sigma X_{1i}X_{2i}}{\sqrt{(\Sigma X_{1i}^2)(\Sigma X_{2i}^2)}} = \frac{X(1,2)}{\sqrt{X(1,1)X(2,2)}} \quad (54)$$

$$r_{61} \equiv r_{16} = \frac{\Sigma X_{1i}X_{6i}}{\sqrt{(\Sigma X_{1i}^2)(\Sigma X_{6i}^2)}} = \frac{X(1,6)}{\sqrt{X(1,1)X(6,6)}} \quad (55)$$

3. CONCLUSION

In an original way the analytical expressions for partial correlation coefficient $r_{i6\cdot12345}$ are defined as well as for characteristic partial coefficients of functional relationship $T_{zi} = Ar_1^a\gamma_2^b\delta_3^c\varphi_4^d\alpha_5^e p_{f6}^g$. The coefficient serves for qualitative estimation how much the theoretical model is in agreement with experimentally obtained data for T_{zi}.

Utilizing partial correlation coefficient $r_{i6\cdot12345}$ for functional relationship (1) the probability of influence of the system characteristic parameter p_f to the valve response time T_{zi} is defined for the case when the system other characteristic parameters ($r,\gamma,\delta,\varphi,\alpha$) are constant.

For the functional relationship $T_{zi} = Ar_1^a\gamma_2^b\delta_3^c\varphi_4^d\alpha_5^e p_{f6}^g$, the coefficients of the best approximation plane in the sense of the least square method [2 to 5, 7 to 10, 13 do 23], that means regression planes, could be obtained from the system matrix (4), [4], utilizing experimental or theoretical data for T_{zi}.

Characteristic partial correlation coefficient $r_{i6\cdot12345}$ for functional relationship (1) is analytically defined via the linear regression equations set, that means via the system matrix (4), [4].

On the basis of the originally developed analytical expression for characteristic partial correlation coefficient and original research plan, [4], an algorithm for calculation of the numerical values of characteristic partial correlation coefficients, is formed, in order to enable making the qualitative estimation of the order of harmony between the theoretical model and experimental data for T_{zi}.

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ANALITIČKA DEFINICIJA VEROVATNOĆE UTICAJA "$T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g$" KARAKTERISTIČNOG SISTEMSKOG PARAMETRA p_f NA VREMENSKI ODZIV VENTILA *Tzi*

Dragan Knežević

Ovaj rad predstavlja originalan način za određivanje analitičkih izraza za parcijalni korelacioni koeficijent $r_{i6\cdot 12345}$ i karakterističnih parcijalnih korelacionih koeficijenata funkcionalne relacije u obliku $T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g$ za kvalitativnu procenu slaganja između teorijskog modela i eksperimentalnih podataka za T_{zi}. Parcijalni korelacioni koeficijent $r_{i6\cdot 12345}$ funkcionalne relacije $T_{zi} = Ar_1^a \gamma_2^b \delta_3^c \varphi_4^d \alpha_5^e p_{f6}^g$, izražen linearno regresivnim setom jednačina, tj. matricom sistema, definiše verovatnoću uticaja karakterističnog sistemskog parametra p_f na vreme odziva T_{zi} sličnih ventila za slučaj kada drugi karakteristični sistemski parametri ostaju konstantni.