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СПОСІБ ВИЯВЛЕННЯ СКРИТОЇ ШУМОМ ПЕРІОДИЧНОСТІ ТРАФІКУ

[illegible]

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Запропоновано спосіб виявлення скритої шумом ... оцінювання параметрів першої гармоніки ... -трафіку. ... рана відстань у просторі Евкліда між реалізацією ... оптимальною оцінкою

Ключові слова: [illegible]

Вступ

[illegible] [1-3].

[illegible]

Мета дослідження

[illegible]

[illegible]:

- [illegible]
- [illegible]

Постановка задачі дослідження

[illegible]

[illegible] Z(t), [illegible] X(t) [illegible] Y(t) [illegible] Z(t) [illegible] X(t) [illegible] Y(t).

[illegible]:

$$X(A_1, \omega_1, \phi_1, t) = A_1[\cos(\omega_1 t)\cos(\phi_1) - \sin(\omega_1 t)\sin(\phi_1)]. \quad (1)$$

[illegible] A_1 - [illegible], ω_1 - [illegible], ϕ_1 – [illegible], t - [illegible].

[illegible] ω_0 [illegible] ω_1 [illegible] φ_0 [illegible] A_0, [illegible]:

$$Y(A_0,\omega_0,\varphi_0,t) = \frac{A_0}{\sqrt{h}}[\cos(\omega_0 t)\cos(\varphi_0) - \sin(\omega_0 t)\sin(\varphi_0)] \quad (2)$$

[illegible]:

$$Z(A_1,\omega_1,\phi_1,A_0,\omega_0,\varphi_0,t) = X(A_1,\omega_1,\phi_1,t)+Y(A_1,h,\omega_0,\varphi_0,t) \quad (3)$$

[illegible]

$$\omega_0 = n_0\cdot\omega_1 \quad (4)$$

[illegible] n_0, [illegible] 10, [illegible] ω_1.

[illegible]

$$\varphi_0 = \frac{k}{n_1}\frac{\pi}{2}, \quad k = 0, 1, \ldots, n_1, \quad (5)$$

[illegible] k – [illegible], n_1 - [illegible], $\phi_0 \in [-\pi/2, \pi/2]$.

[illegible] (3–5) [illegible] (3) [illegible]:

$$Z(t,h,n_0,k) = A_1\left[\cos(\omega_1 t-\phi_1)+\frac{1}{\sqrt{h}}\cos\left(n_0\omega_1 t-\frac{k}{n_1}\frac{\pi}{2}\right)\right] \quad (6)$$

Основна частина

[illegible]

$$S(A_1,\omega_1,\phi_1)=\sum_t^{T2}[Z(h,n_0,k,t) - X(A_1,\omega_1,\phi_1,t)]^2, \quad (7)$$

[illegible] t – [illegible], T2 – [illegible].

[illegible] (7).

[illegible]:

$$\sum_t[Z(h,n_0,k,t)-X(A_1,\omega_1,\phi_1,t)]\cos(\omega_1 t-\phi_1)=0 \quad (8)$$

$$\sum_t[Z(h,n_0,k,t)-X(A_1,\omega_1,\phi_1,t)]\sin(\omega_1 t-\phi_1)t=0 \quad (9)$$

$$\sum_t [Z(h,n_0,k,t) - X(A_1,\omega_1,\phi_1,t)]\sin(\omega_1 t - \phi_1) = 0 \qquad (10)$$

[illegible] (8) [illegible]

$$A_{1opt} = \frac{\sum_t [Z(h,n_0,k,t)\cos(\omega_1 t - \phi_1)]}{\sum_t \cos(\omega_1 t - \phi_1)^2} \qquad (11)$$

[illegible]

[illegible] (9) [illegible] (10) [illegible]

[illegible]

[illegible]

[illegible] (9) [illegible] ω_1 [illegible] (12), [illegible] (13) [illegible] (14) [illegible]:

$$\mathrm{LP1}(\omega_1) = \sum_t X(A_1,\omega_1,\phi_1,t)\sin(\omega_1 t - \phi_1)t, \qquad (12)$$

$$\mathrm{RP1}(\omega_1,\mathrm{h},\mathrm{n}_0,\mathrm{k}) = \sum_t Z(h,n_0,k,t)\sin(\omega_1 t - \phi_1)t, \qquad (13)$$

$$\Delta LP1(\omega_1,\mathrm{h},\mathrm{n}_0,\mathrm{k}) = \mathrm{LP1}(\omega_1) - \mathrm{RP1}(\omega_1,\mathrm{h},\mathrm{n}_0,\mathrm{k}). \qquad (14)$$

[illegible] (10) [illegible] ϕ_1 [illegible]

$$\mathrm{LP2}(\phi_1) = \sum_t X(A_1,\omega_1,\phi_1,t)\sin(\omega_1 t - \phi_1), \qquad (15)$$

$$\mathrm{RP2}(\phi_1,h,n_0,k,) = \sum_t Z(h,n_0,k,t)\sin(\omega_1 t - \phi_1), \qquad (16)$$

$$\Delta LP2(\phi_1,h,n_0,k,) = \mathrm{LP2}(\phi_1) - \mathrm{RP2}(\phi_1,h,n_0,k,). \qquad (17)$$

[illegible] (14) [illegible]

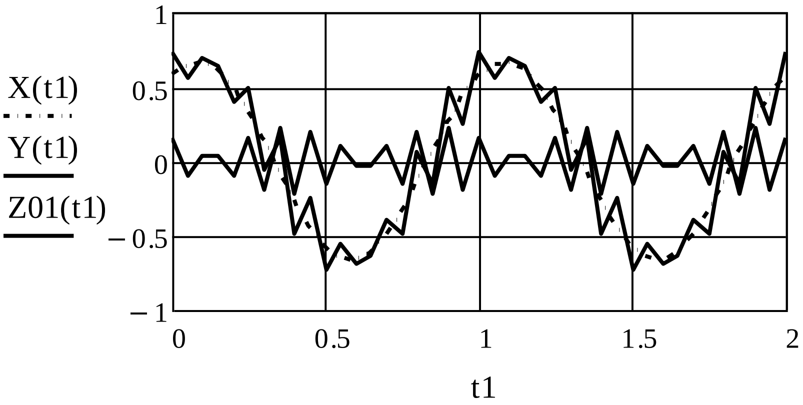
$$\Delta 1(\omega_1,\mathrm{h2},\mathrm{n}_0,\mathrm{k})\sqrt{\mathrm{h2}} = \Delta 1(\omega_1,\mathrm{h1},\mathrm{n}_0,\mathrm{k})\sqrt{\mathrm{h1}}, \qquad (18)$$

$$\frac{\Delta 1(\omega_1,\mathrm{h2},\mathrm{n}_0,\mathrm{k})}{\Delta 1(\omega_1,\mathrm{h1},\mathrm{n}_0,\mathrm{k})} = \frac{\sqrt{\mathrm{h1}}}{\sqrt{\mathrm{h2}}} \qquad (19)$$

[illegible] $\Delta 1(\omega_1,\mathrm{h1},\mathrm{n}_0,\mathrm{k})$, [illegible] *h1* [illegible] *n_0, k,* [illegible] $\Delta 2(\omega_1,\mathrm{h2},\mathrm{n}_0,\mathrm{k})$ [illegible] *h2* [illegible] (18), (19) [illegible]

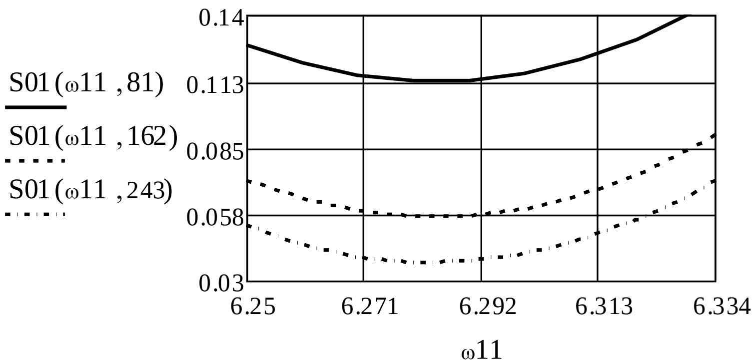
[illegible]

[illegible] (17) - [illegible] (11) - [illegible] (14). [illegible]



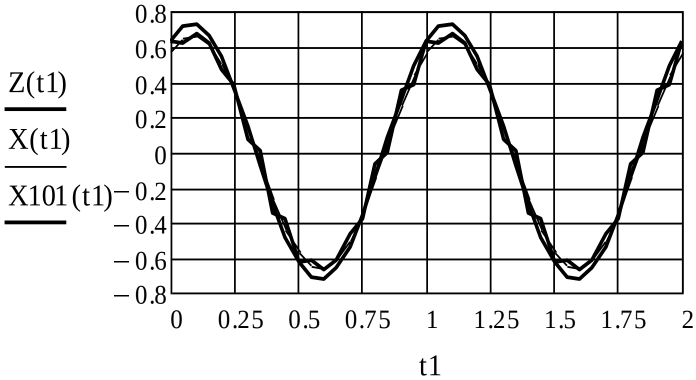
[illegible]. 1. [illegible] X(t1), [illegible] Y(t1) [illegible] Z01(t1) [illegible] h01 = 81

[illegible]. 1 [illegible] Z(t1) [illegible] t1 [illegible] h01 = 81. [illegible] X(t1) [illegible] Y(t1). [illegible]



[illegible]. 2. [illegible]

[illegible]. 2 [illegible]



[illegible]. 3. [illegible] Z(t1), [illegible] X(t1) [illegible] X101(t1)

[illegible] 3 [illegible].3, [illegible]

Висновки

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Список літератури

1. [illegible] 2000. - [illegible]. 130-139.

2. [illegible] 2014. - [illegible]. 3(47). - [illegible]. 36-40.

3. [illegible] 2011. - [illegible]. 3(35). - [illegible]. 13-20.

[illegible] 24.05.2015