|  |
| --- |
| %%INITIAL CONDITIONS |
|  |
| thetaa1 = 500; % переменная составляющая температуры  thetaa = 1000+thetaa1\*cos(w\*t); |
| w = 2\*pi\*1/4/3600; %частота |
| t = 0:10:4800; %время |
| q1rad = 20000; %%переменная лучистая компонента |
| k = 1; %% показатель поглощения |
| sigma = 100; %% показатель рассеяния |
| B = 200; %%коэффициент теплоотдачи воздушная среда-поверхность |
| b = sqrt(k\*k+k\*sigma); |
| A = (b-k)/(b+k); %% альбедо |
| c = 450; %%теплоёмкость |
| rho = 1000; %%плотность |
| Kt = 0.1; %% коэффициент теплопроводности |
| at = Kt/c/rho; %%коэффициент температуропроводности |

z = 0:0.001:0.3;

psi = asin(c2/(c1\*c1+c2\*c2));

CC1 = sqrt(c1\*c1+c2\*c2);

CC2 = b\*(1-A)./(sqrt(w.\*w+at.\*at.\*b.\*b.\*b.\*b)).\*q1rad./c/rho;

theta = CC1\*cos(w.\*t-psi-sqrt(w/2/at).\*z).\*exp(-sqrt(w/2/at).\*z)-CC2.\*cos(w.\*t-phi1).\*exp(-b.\*z);

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| --- |
| 1  2  3  4 |
|  |
| **Figure 1. Diagram for the temperature inside medium versus depth for initial time:**  for different values of , where  a – convective term, b – radiation term  1 -  2 -  3 -  4 - |

|  |
| --- |
| 4  3  2  1 |
|  |
| **Figure 1. Diagram for the temperature inside medium versus depth for time 900s:**  for different values of , where  a – convective term, b – radiation term  1 -  2 -  3 -  4 - |

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| --- |
| 4  3  2  1 |
|  |
| **Figure 1. Diagram for the temperature inside medium versus depth for time 1800s:**  for different values of , where  a – convective term, b – radiation term  1 -  2 -  3 -  4 - |

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| 4  3  2  1 |
|  |
| **Figure 1. Diagram for the temperature inside medium versus depth for time 2400s:**  for different values of , where  a – convective term, b – radiation term  1 -  2 -  3 -  4 - |
| 4  3  2  1 |
|  |
| **Figure 1. Diagram for the temperature inside medium versus depth for time 3600s:**  for different values of , where  a – convective term, b – radiation term  1 -  2 -  3 -  4 - |

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| --- |
| 3  1  2 |
|  |
| **Figure 1. Diagram for the temperature inside medium versus depth for time 4800s:**  for different values of , where  a – convective term, b – radiation term  1 -  2 -  3 - |

z=0

c1 = ((Kt\*sqrt(w./(2\*at))+B)\*F1+Kt\*sqrt(w/(2\*at))\*F2)./delta; %%3.25

c2 = ((Kt\*sqrt(w./(2\*at))\*F1)-(Kt\*sqrt(w./(2\*at))+B)\*F2)./delta; %%3.25

θconv = sqrt(c1\*c1+c2\*c2) \*cos(w.\*t-psi)

θrad = -b\*(1-A)./(sqrt(w.\*w+at.\*at.\*b.\*b.\*b.\*b)).\*q1rad./c/rho\*cos(w.\*t-psi)

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| --- | --- |
|  |  |
| ***a*** | ***b*** |
| **Figure 1. a – Diagram for separate convective and radiation fluxes terms in an equation:**  for different values of , where  a – convective term, b – radiation term  1 -  2 -  3 - | |

|  |  |
| --- | --- |
| 3a  2a  2c  3c  3b  2b  1b  1a  1c | tres1_3d |
| ***a*** | ***b*** |
| **Figure 1. a – Diagram for separate convective and radiation fluxes terms, sum of fluxes in an equation:**  **b – 3d plot of temperature vs time vs depth**  for different values of , where  a – convective term, b – radiation term, c – sum of terms  1 -  2 -  3 - | |

|  |  |
| --- | --- |
|  | C:\Users\1\AppData\Local\Microsoft\Windows\INetCache\Content.Word\tres1_3d.png |
| ***a*** | ***b*** |
| **Figure 1.**Diagram for  – на одном графическом поле   = 1000 0C  500 0C - керамика    для = 0 30 60 90  2- z= 0  и  и  вместе с распечаткой фаз . | |

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|  | **Figure 2.** Thermoradiate resonance at the formation of the general  surface temperature field  (21) with additive terms  independent radiant overheating which is produced in phase with convective heat exchange (7) on the exposed boundary for samples of quartz ceramics: porous (semitransparent - a) and monolithic (transparent - b) material. Dependence albedo *A* from phase shift *Δφrс* between the convective and radiant components of the external heat flux with the oscillation period:Lines 1*a*, 1*b* - *T=*4 hour; Lines 2*a*, 2*b* - *T=*2 hour; Lines 3*c*, 3*d* - *T=*24 hour (for snow); Lines 4*c*, 4*d* - *T=*24 (ice); Lines 1-4 for *κ* = 1 m-1, Lines 4-3 for *κ* = 2 m-1. |

θA1



