Әл-Фараби атындағы Қазақ ұлттық университеті	Al-Farabi Kazakh National University
РҒА СБ есептеу технологиялары институты	Institute of Computational Technologies of SB RAS
Қазақстан Республикасының Ұлттық Инженерлік академиясы	National Engineering Academy of the Republic of Kazakhstan
Штутгарт өнімділігі жоғары есептеу орталығы	High Performance Computing Centre in Stuttgart
Косовска Митровицасындағы Приштин университеті	University of Pristina in Kosovska Mitrovica
Абу-Даби университеті	Abu Dhabi University
Новосібір ұлттық зерттеу мемлекеттік университеті	Novosibirsk National Research State University
Новосібір мемлекеттік техникалық университеті	Novosibirsk State Technical University
Сібір телекоммуникация және информатика мемлекеттік университеті	Siberian State University of Telecommunications and Information Sciences
Ақпараттық және есептеу технологиялар институты	Institute of Information and Computational Technologies

ТЕЗИСТЕР

Халықаралық конференция “Ғылымдағы, техникадағы және білім берудегі есептеулер мен ақпараттар технологиясы”

ABSTRACTS

International Conference “Computational and Informational Technologies in Science, Engineering and Education”

CITech2015

intel Software

24-27 қыркүйек 2015
Алматы, Қазақстан

September 24-27 2015
Almaty, Kazakhstan

producing the smallest spread of the solution. The numerical experiments revealed that the non-optimal choice of the limiter can result in the overgrowth of the mixing layer, that is important for the numerical modeling of the combustion. The results of the numerical computations show good agreement with the experimental data.

References

[1] Beketaeva A.O., Naimanova A.Z., *Application of ENO (essentially nonoscillatory) scheme to modeling of multi-component flows*, Computational technologies, Vol 12, Special issue 4, 17-25 (2007).

[2] Bruel, P. and Naimanova, A., *Computation of the normal injection of a hydrogen jet into a supersonic air flow*, Thermophysics and Aeromechanics, Vol. 17, Issue 4, 531-542 (2010).

[3] Moisseyeva, Ye. and Naimanova, A., *Numerical simulation of the transverse hydrogen injection into a supersonic turbulent airstream*, Proceedings of APM-2014, St.-Petersburg, Russia, 358-365 (2014).

▶ **Badr Munir** - GIK Institute of Engg.Sci.and Technology,Topi, Pakistan, **Baydaulet A. Urmashev** - Al-Farabi KazNU, Almaty, Kazakhstan, email: baydaulet.urmashev@mail.ru and **Alexei A.Kavokin** - Al-Farabi KazNU, Almaty, Kazakhstan, email: kavokin_alex@yahoo.com

Computational model of thermo-diffusive processes in electrodes by arcing

The computational model of thermo-chemical processes in the cathode of plasmatron working in the gas environment is investigated. The core of this model is an algorithm of numerical solution of the system of differential equations which describe electromagnetic, temperature and concentration fields inside of a body of electrodes taking into account kinetic of phase transformation and chemical reaction in accordance with a state diagram, [1,2]. The offered approach is simpler for computing in domain with free boundary than the well-known Stefan's approach of describing of analogous processes. The unknown kinetic coefficient was determined from the best fit exact self-similar and numerical solutions of one-dimensional case.As an instance the case of copper cathodes with the zirconium insertion in the environment of oxygen is considered. The electrical current density through the surface of the insertion and it's temperature are presented in the form of a bell-shaped function. Function parameters are determined from the given process conditions. The influence of separate parts of process on distribution of temperature inside of the insertion is estimated. On the basis of this analysis the opportunity of use of stationary approach for electric and temperature fields was estimated and approximate analytical formulas for temperature are received. After that a numerical solution for gas concentration distribution is obtained. The calculations on the specified model show that the size of area of a phase zirconium oxides depends mainly upon coefficient of diffusion of oxygen. The calculations for various types of dependencies of gas diffusion coefficient from