

# IJTPE Journal

## International Journal on TECHNICAL AND PHYSICAL PROBLEMS OF ENGINEERING (IJTPE)

<http://www.iotpe.com>  
<http://www.iotpe.com/ijtpe.html>  
ijtpe@iotpe.com, ijtpe0@gmail.com

Issue 36

Volume 10

Number 3

September 2018

Serial No: 0036-1003-0918



### Founders and Publishers:

### **International Organization of IOTPE**



Institute of Physics  
Azerbaijan National Academy of Sciences  
Baku, Azerbaijan  
[www.science.gov.az/physics](http://www.science.gov.az/physics)



Azerbaijan Research Institute of  
Energetics and Energy Design  
Azerenerji JSC, Baku, Azerbaijan  
<http://pei.az>



Cleaner Production and  
Energy Efficiency Center  
Baku, Azerbaijan  
<http://cpee.az>



Nakhchivan State University  
Nakhchivan, Azerbaijan  
[www.ndu.edu.az](http://www.ndu.edu.az)



University of Pitesti  
Pitesti, Romania  
[www.upit.ro](http://www.upit.ro)



University of the Basque Country  
Bilbao, Spain  
[www.ehu.es](http://www.ehu.es)



Ostfold University College  
Fredrikstad, Norway  
[www.hiof.no](http://www.hiof.no)



Seraj Higher Education Institute  
Tabriz, Iran  
[www.seraj.ac.ir](http://www.seraj.ac.ir)



Taba Elm International Institute  
Tabriz, Iran  
[www.tabaelm.com](http://www.tabaelm.com)



Gazi University  
Ankara, Turkey  
[www.gazi.edu.tr](http://www.gazi.edu.tr)



Istanbul Technical University  
Istanbul, Turkey  
[www.itu.edu.tr](http://www.itu.edu.tr)



Isik University  
Istanbul, Turkey  
[www.isikun.edu.tr](http://www.isikun.edu.tr)



Van Yuzuncu Yıl University  
Van, Turkey  
[www.yyu.edu.tr](http://www.yyu.edu.tr)



Near East University  
Lefkosa, Northern Cyprus  
[www.neu.edu.tr](http://www.neu.edu.tr)

**IJTPE Journal**  
**International Journal on**  
**TECHNICAL AND PHYSICAL PROBLEMS OF ENGINEERING**  
**(IJTPE)**

**Published by International Organization of IOTPE**

<http://www.iotpe.com>  
<http://www.iotpe.com/ijtpe.html>  
ijtpe@iotpe.com, ijtpe0@gmail.com

**Issue 36**

**Volume 10**

**Number 3**

**Serial No: 0036-1003-0918**

**September 2018**

**EDITORS-IN-CHIEF:**

- Academician Arif Mamed HASHIMOV
- Prof. Naser MAHDAVI TABATABAEI
- Prof. Nicu BIZON

**SCIENTIFIC AND EXECUTIVE SECRETARIES:**

- Narges Sadat BOUSHEHRI, M.Sc. - Ali JAFARI, M.Sc. - Ali PASHAEI, Ph.D.

**EDITORIAL BOARD:**

- Prof. Javier BILBAO, University of the Basque Country (*Bilbao, Spain*)
- Prof. Nicu BIZON, University of Pitesti (*Pitesti, Romania*)
- Prof. Kamil M. DURSUN, Ostfold University College (*Fredrikstad, Norway*)
- Asst. Prof. Reza EFFATNEJAD, Islamic Azad University, Karaj Branch (*Karaj, Iran*)
- Prof. Naci GENC, Van Yuzuncu Yil University (*Van, Turkey*)
- Acad. Arif M. HASHIMOV, Institute of Physics of Azerbaijan National Academy of Sciences (*Baku, Azerbaijan*)
- Asst. Prof. Hojat HATAMI, Seraj Higher Education Institute (*Tabriz, Iran*)
- Prof. Silviu IONITA, University of Pitesti (*Pitesti, Romania*)
- Prof. Ramiz A. ISKANDEROV, Azerbaijan University of Architecture and Construction (*Baku, Azerbaijan*)
- Prof. Yorgo ISTEFANOPULOS, Isik University (*Istanbul, Turkey*)
- Prof. Saleh H. MAHARRAMOV, Nakhchivan State University (*Nakhchivan, Azerbaijan*)
- Prof. Naser MAHDAVI TABATABAEI, Seraj Higher Education Institute (*Tabriz, Iran*)
- Prof. Ozgur C. OZERDEM, European University of Lefke (*Lefke, Northern Cyprus*)
- Assoc. Prof. Kamil B. QURBANOV, Institute of Physics of Azerbaijan National Academy of Sciences (*Baku, Azerbaijan*)
- Prof. Nariman R. RAHMANOV, Azerbaijan Research Institute of Energetics & Energy Design (*Baku, Azerbaijan*)
- Prof. Ali ROSTAMI, University of Tabriz (*Tabriz, Iran*)
- Assoc. Prof. Rustam B. RUSTAMOV, Institute of Physics of Azerbaijan National Academy of Sciences (*Baku, Azerbaijan*)
- Prof. Fahreddin M. SADIKOGLU, Near East University (*Lefkosa, Northern Cyprus*)
- Prof. Heidar Ali SHAYANFAR, Iran University of Science and Technology (*Tehran, Iran*)
- Prof. M. Cengiz TAPLAMACIOGLU, Gazi University (*Ankara, Turkey*)
- Prof. Omer USTA, Istanbul Technical University (*Istanbul, Turkey*)

**ADVISORY BOARD:**

- Prof. Senol BEKTAS, Near East University (*Lefkosa, Northern Cyprus*)
- Assoc. Prof. Robert BELOIU, University of Pitesti (*Pitesti, Romania*)
- Prof. Eugenio BRAVO, University of the Basque Country (*Bilbao, Spain*)
- Prof. Dominic B.O. KONDITI, Multimedia University College of Kenya (*Nairobi, Kenya*)
- Prof. Ires ISKENDER, Gazi University (*Ankara, Turkey*)
- Prof. Anvar T. KHUDIEV, Institute of Petrochemical Processes of Azerbaijan National Academy of Sciences (*Baku, Azerbaijan*)
- Assoc. Prof. Mohammad MORADZADEH, University of Huddersfield (*Huddersfield, UK*)
- Assoc. Prof. Mihai OPROESCU, University of Pitesti (*Pitesti, Romania*)

**SCIENTIFIC BOARD:**

- Ahrabian, Gh., Asst. Prof. (*Iran*)  
Akcam, N., Asst. Prof. (*Turkey*)  
Aksen, A., Prof. (*Turkey*)  
Alizade, P., Prof. (*Turkey*)  
Ardehali, M.M., Prof. (*Iran*)  
Ari, M., Assoc. Prof. (*Turkey*)  
Arntsen, E. (*Norway*)  
Aydemir, T.M. (*Turkey*)  
Banan, Kh., Asst. Prof. (*Iran*)  
Bay, O.F., Prof. (*Turkey*)  
Behjat, V., Asst. Prof. (*Iran*)  
Bektas, S., Prof. (*Northern Cyprus*)  
Beloiu, R., Assoc. Prof. (*Romania*)  
Bilbao, J., Prof. (*Spain*)  
Bizon, N., Prof. (*Romania*)  
Boushehri, N.S. (*Iran*)  
Bravo, E., Prof. (*Spain*)  
Chirlesan, D., Assoc. Prof. (*Romania*)  
Constantinescu, L., Asst. Prof. (*Romania*)  
Costea, M., Dr. (*Romania*)  
Darabi, A., Prof. (*Iran*)  
Demiroren, A., Prof. (*Turkey*)  
Dursun, K.M., Prof. (*Norway*)  
Effatnejad, R., Asst. Prof. (*Iran*)  
Eguia, P., Prof. (*Spain*)  
Eke, I., Dr. (*Turkey*)  
Faiz, J., Prof. (*Iran*)  
Farsadi, M., Assoc. Prof. (*Iran*)  
Farsangi, M.M., Assoc. Prof. (*Iran*)  
Feizi, M.R., Prof. (*Iran*)  
Fianu, S., Asst. Prof. (*Romania*)  
Forrisdal, O.K., Assoc. Prof. (*Norway*)  
Genc, N., Prof. (*Turkey*)  
Ghanbari, E., Prof. (*Iran*)  
Gholami, A., Prof. (*Iran*)  
Gonzalez, P., Prof. (*Spain*)  
Gozde, H., Assoc. Prof. (*Turkey*)  
Hardalac, F., Assoc. Prof. (*Turkey*)  
Hasanov, E.R., Prof. (*Azerbaijan*)  
Hasanova, S.I., Asst. Prof. (*Azerbaijan*)  
Hashimov, A.M., Acad. (*Azerbaijan*)  
Hatami, H., Asst. Prof. (*Iran*)  
Hernandez, J.R., Prof. (*Spain*)  
Huseynov, A., Prof. (*Azerbaijan*)  
Ionita, S., Prof. (*Romania*)  
Iordache, M. (*Romania*)  
Iskanderov, R.A., Prof. (*Azerbaijan*)  
Iskender, I., Prof. (*Turkey*)  
Istefanopoulos, Y., Prof. (*Turkey*)  
Izykowski, J., Prof. (*Poland*)  
Jadid, Sh., Prof. (*Iran*)  
Jafari, A. (*Iran*)  
Kalantar, M., Prof. (*Iran*)  
Kazemi, A., Assoc. Prof. (*Iran*)  
Kenarangui, R., Prof. (*USA*)  
Khalin, M.V., Prof. (*Russia*)  
Khalina, T.M., Prof. (*Russia*)  
Khudiev, A.T., Prof. (*Azerbaijan*)  
Kocaarslan, I., Prof. (*Turkey*)  
Kocabas, D.A., Asst. Prof. (*Turkey*)  
Konditi, D.B.O., Prof. (*Kenya*)  
Kuznetsov, V., Prof. (*Ukraine*)  
Lefter, E. (*Romania*)  
Lita, I. (*Romania*)  
Mamedov, N.A., Prof. (*Azerbaijan*)  
Mehdiyev, T.R., Prof. (*Azerbaijan*)  
Moradzadeh, M., Assoc. Prof. (*UK*)  
Mordt, H., Assoc. Prof. (*Norway*)  
Mustafayev, R.I., Prof. (*Azerbaijan*)  
Nasirzadeh, N., Asst. Prof. (*Iran*)  
Nuriyev, M.A., Assoc. Prof. (*Azerbaijan*)  
Oprescu, B., Prof. (*Romania*)  
Oproescu, M., Assoc. Prof. (*Romania*)  
Oraee, H., Prof. (*Iran*)  
Ozerdem, O.C., Prof. (*Northern Cyprus*)  
Pashaei, A. (*Iran*)  
Pavlyuchenko, D.A., Prof. (*Russia*)  
Qurbanov, K.B., Assoc. Prof. (*Azerbaijan*)  
Rahmanov, N.R., Prof. (*Azerbaijan*)  
Ramos, J.A. (*Spain*)  
Rebollar, C., Prof. (*Spain*)  
Rosolowski, E., Prof. (*Poland*)  
Rostami, A., Prof. (*Iran*)  
Rzayev, F.T., Dr. (*Azerbaijan*)  
Sadikoglu, F.M., Prof. (*Northern Cyprus*)  
Sazli, M.H., Assoc. Prof. (*Turkey*)  
Sefa, I., Dr. (*Turkey*)  
Senol, M.A., Dr. (*Turkey*)  
Serban, G., Prof. (*Romania*)  
Sharifian, M.B.B., Prof. (*Iran*)  
Shayanfar, H.A., Prof. (*Iran*)  
Shayeghi, H., Assoc. Prof. (*Iran*)  
Shidlovsky, A., Prof. (*Ukraine*)  
Stanescu, C., Prof. (*Romania*)  
Tabatabaei, Naser M., Prof. (*Iran*)  
Tabatabaei, Nejat M., Asst. Prof. (*Germany*)  
Taghizadegan, N., Dr. (*Iran*)  
Taplamacioglu, M.C., Prof. (*Turkey*)  
Usta, O., Prof. (*Turkey*)  
Varela, C., Prof. (*Spain*)  
Vishtibeyev, A. Prof. (*Russia*)

## **EDITORIAL NOTE**

We are pleased to present International Journal on "Technical and Physical Problems of Engineering" (IJTPE) in English and electronic print published seasonal periodically by the partners of International Organization on "Technical and Physical Problems of Engineering" (IOTPE) including Institute of Physics of Azerbaijan National Academy of Sciences (Baku, Azerbaijan), Azerbaijan Research Institute of Energetics and Energy Design (Azerenerji JSC, Baku, Azerbaijan), Cleaner Production and Energy Efficiency Center (Baku, Azerbaijan), Nakhchivan State University (Nakhchivan, Azerbaijan), Seraj Higher Education Institute (Tabriz, Iran), Nakhchivan State University (Nakhchivan, Azerbaijan), Taba Elm International Institute (Tabriz, Iran), Gazi University (Ankara, Turkey), Istanbul Technical University (Istanbul, Turkey), Isik University (Istanbul, Turkey), Van Yuzuncu Yil University (Van, Turkey), University of Pitesti (Pitesti, Romania), University of the Basque Country (Bilbao, Spain), Near East University (Lefkosa, Northern Cyprus) and Ostfold University College (Fredrikstad, Norway).

The IOTPE organization is a scientific association, founder and holder of International Conferences on "Technical and Physical Problems of Power Engineering" (ICTPE) have been held from 2002 to 2012.

The ICTPE Conferences name and topics are improved to International Conference on "Technical and Physical Problems of Electrical Engineering" (ICTPE) in the in 2013 Conference to cover subjects in all fields and topics of Electrical Engineering and have been held till now.

The IOTPE organization is generally managing and performing a set of scientific-executive affairs to holding International Conference of ICTPE, publishing International Journal of IJTPE and directing International Enterprise of IETPE.

Successful organizing and holding ICTPE conference and publishing IJTPE journal indicates close friendship and scientific collaboration of the scientists and researchers of member countries in engineering field development between the countries. The importance of holding ICTPE conference and publishing IJTPE journal are mutual understanding and recognition between the organizer countries through scientific, social and cultural development where yields increasing international cooperation in scientific areas.

Furthermore, the importance subjects of ICTPE conference and IJTPE journal are related to the opportunity for researches and scientists from different countries to clarify and discuss the latest and mutual research achievements and improvements as well as generalization of the internationally obtained results in the area of engineering and new technologies.

The conducting of ICTPE conference and IJTPE journal are based on important principle of the cooperative relationship between science and industry. This relationship is a basis for the activity of contemporary engineering companies. It is well known that important technical advance is possible only due to achievements of fundamental science.

Publishing IJTPE journal is getting increasing importance for cooperation of researchers and scientific centers of different countries. We strongly believe the journal provides the establishing scientific relationships and also increase the cooperation of east and west countries on the subject of engineering fields and applying the new technologies on solving technical and physical problems.

By the mean of IJTPE journal publication, the cooperation with the partners from the involved countries and also all of the worlds will be fostered. It is the main objective to enhance the level of multilateral exchanges, the involvement of authors in developing and improving the scientific research.

The IJTPE journal is registered, cited and indexed in some scientific organization and databases.

We will do our best to disseminate the journal's results and forward to the possible technological transfer of the accumulated knowledge of the scientific contributions of the authors.

Finally, we wish to express our gratefulness to all the authors and scientists from all over the world who have scientific reports in preparing the transactions published in the journal.

### **Editors-in-Chief**

**Academician Arif Mamed HASHIMOV  
Prof. Naser MAHDAVI TABATABAEI  
Prof. Nicu BIZON**

<b>NO</b>	<b>CONTENTS</b>	<b>PAGES</b>
1	MODELING AND PERFORMANCE ANALYSIS OF CUK CONVERTER USING PI AND OCC METHOD A. Karaarslan	1-5
2	AN IOT APPLICATION WITH PARTICLE CARD OVER CLOUD I. Tarimer, S. Eren	6-13
3	POWER MANAGEMENT STRATEGY OF GRID CONNECTED SOLAR POWER GENERATION D. Celik, M.E. Meral	14-18
4	AN EFFECT OF MOLAR CONCENTRATION ON PROPERTIES OF SPRAY DEPOSITED COPPER OXIDE THIN FILMS R. Ozmentes, C. Temirci	19-23
5	RESEARCH OF CHARACTERISTICS OF ELECTRICAL DISCHARGES IN WATER MEDIUM UNDER THE ACTION OF HIGH VOLTAGE PULSES E.J. Gurbanov, A.M. Hashimov, K.B. Gurbanov	24-29
6	DETERMINING THE STATISTICAL SURVEY OF OCCUPATIONAL INJURIES IN MINES; RISK ANALYSIS MODELLING, SOFTWARE DEVELOPED ON THE BASIS OF FUZZY LOGIC TO PREVENT JOB ACCIDENTS M. Zile	30-38
7	PHYSICOCHEMICAL AND SOME ELECTROPHYSICAL PROPERTIES OF IN <sub>2</sub> Te <sub>3</sub> -Ni <sub>3</sub> Te <sub>4</sub> SYSTEM ALLOYS Ch.I. Abilov, M.Sh. Hasanova, E.K. Gasimova	39-43

\* The issues of IJTPE Journal are registered, cited and indexed in:



■ The Norwegian Association of Higher Education Institutions (UHR) and The Norwegian Social Science Data Services (NSD), [www.nsd.no/english](http://www.nsd.no/english), on behalf of The Norwegian Ministry of Education and Research since 2013.  
Indexing address:  
[https://dbh.nsd.uib.no/publiseringskanaler/KanalTidsskriftInfo?id=480511&bibsys=0&request\\_locale=en](https://dbh.nsd.uib.no/publiseringskanaler/KanalTidsskriftInfo?id=480511&bibsys=0&request_locale=en)



■ Google Scholar, <http://scholar.google.com/>, for searching, exploring, locating, keeping, checking and citing the publications and authors through the libraries and on the web since 2013.  
Search for: IJTPE  
<https://scholar.google.com/citations?hl=da&user=gfWxEhEAAAAJ>



■ Index Copernicus International (ICI), <http://en.indexcopernicus.com/>, since 2013.  
Indexing address:  
<http://jml2012.indexcopernicus.com/International+Journal+on+Technical+and+Physical+Problems+of+Engineering,p24780390,3.html>



■ **Science Impact Factor (SIF)**, <http://scienceimpactfactor.com/>, since 2014.

**Impact Factor = 4.54**

Indexing address:

<http://scienceimpactfactor.com/?p=241>



■ **Research Bible** Academic Research Index, <http://journalseeker.researchbib.com/>, since 2016.

Indexing address:

<http://journalseeker.researchbib.com/view/issn/2077-3528>



■ **Scientific Indexing Services (SIS)**, <http://www.sindexs.org/>, since 2016.

Indexing address:

<http://www.sindexs.org/JournalList.aspx?ID=3176>