



TESNAT 2019

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Abstract Book

Editors

Eyyup TEL, Abdullah AYDIN, İsmail Hakkı SARPÜN, Hasan ÖZDOĞAN

Dear Colleagues,

Welcome to the 5th International Conference on Theoretical and Experimental Studies in Nuclear Applications and Technology (TESNAT 2019). This conference is the fifth step of the TESNAT Conference series. TESNAT 2015 was held in Osmaniye Korkut Ata University, Osmaniye, TESNAT 2016 was held in Mustafa Kemal University, Hatay, TESNAT 2017 was held in Çukurova University, Adana and TESNAT 2018 was held in Akdeniz University, Antalya. The world of nuclear physics is an exciting area in which to work, and we'll continue to meet and bring inspired people together in conference like this, to ensure TESNAT remains at the cutting edge.

We intend in this conference to discuss and compare all applicable methods as are being applied at present in nuclear physics. The problems faced in these fields at present are focused in the development of new methods and in the improving of existing techniques to achieve an understanding of existing experimental data and in predicting with high reliability new properties and processes. We propose this conference as a mean to bring together all these related communities with the goal of creating an enriching dialog across the disciplines. The conference will give an overview on the theoretical and experimental challenges in nuclear physics and applications.

We'd like to thank each of you for attending our conference and bringing your expertise to our gathering. You are truly our greatest asset today and tomorrow, and we could not accomplish what we do without your support and leadership.

TESNAT 2019 Organization Committee

Contents

Contents.....	ii
Committees.....	vi
Honorary Committee.....	vi
Organising Committee.....	vi
Local Organizing Committee	vi
Scientific Committee	vii
Scientific Program	vii
Invited Talks	0
<i>Recent developments of optically stimulated luminescence (OSL) dosimetry in medical use.....</i>	<i>1</i>
<i>Study of the effect of newly calculated phase space factor on β-decay half-lives</i>	<i>2</i>
<i>Eighty years of the Kramers problem in the nuclear fission theory</i>	<i>3</i>
<i>The Nuclear Matter Equation Of State: VMC Calculations</i>	<i>4</i>
<i>Recent development on gamma-ray and neutron detection systems</i>	<i>5</i>
Oral Presentations.....	6
<i>Some energy transitions in Ti and its yields after photonuclear reaction</i>	<i>7</i>
<i>Theoretical Calculations of Energy Levels and Transition Probabilities for even-even Si, S and Ar Isotopes</i>	<i>8</i>
<i>$^8\text{B}+^{12}\text{C}$ elastic scattering system: investigation of radius sensitivity and long-absorption mechanism of imaginary potential</i>	<i>9</i>
<i>Comparative optical model analysis of $^8\text{He}+^{208}\text{Pb}$ elastic scattering systems around barrier energy</i>	<i>10</i>
<i>Calculation of WER values of three (Al, PMMA and, PS) potential dosimetric materials applied in helium ion beam therapy up to 150 MeV/u.....</i>	<i>11</i>
<i>Experimental evaluation of dose-response of high density polyethylene/multi-walled carbon nanotube nanocomposite against gamma rays through a resistive dosimeter</i>	<i>12</i>
<i>Fabrication of low electrical percolation threshold polystyrene/multi-walled carbon nanotube nanocomposites via a mixed solution method with dosimetry purposes.....</i>	<i>13</i>
<i>Effect of added guard electrode on electric field uniformity of a real-time dosimeter based on polymer-nanotube nanocomposite using finite element method</i>	<i>14</i>
<i>On the ground-state nuclear properties of superheavy Hs, Ds and Cn nuclei.....</i>	<i>15</i>
<i>Positron CSDA Range and stopping power calculations in some human body tissues for 20 eV to 100 MeV with the modified Rohrlich–Carlson model by using Tietz screening function.....</i>	<i>16</i>
<i>Experimental investigation of gamma radiation attenuation coefficients for some materials used for radiotherapy</i>	<i>17</i>
<i>Homogeneous and heterogeneous fuel core analyses in accelerator driven systems and fusion-fission hybrid reactors... ..</i>	<i>18</i>
<i>Systematics studies of $(n,n'p+d)$ reaction cross sections at 14.5 MeV neutrons energy.....</i>	<i>19</i>
<i>Study of redistribution of Cs-137 in forest land for soil erosion assessment</i>	<i>20</i>
<i>Radon activity in well water and radiation dose estimation in the granite-rich regions of central Anatolia, Turkey.....</i>	<i>21</i>
<i>Angular elastic neutron distribution of ^{197}La target.....</i>	<i>22</i>
<i>Theoretical cross section calculation of elastic neutron scattering from ^{197}Au, ^{182}W and ^{186}W.....</i>	<i>23</i>
<i>Radioiodinated baicalein as novel agent targeted for brain cancer and neurodegenerative diseases</i>	<i>24</i>
<i>Natural radioactivity levels in association with geological structure of Afyonkarahisar</i>	<i>25</i>

<i>Influences of gate oxide thickness on the irradiation sensitivity of the NürFET dosimeters</i>	<i>26</i>
<i>Excitation of the autoionizing states of helium by electron impact.....</i>	<i>27</i>
<i>Excitation cross-sections of some autoionizing states of helium at 200 eV.....</i>	<i>28</i>
<i>Cross sections and thermonuclear reaction rates for $^{50}\text{Cr}(\alpha, n)^{53}\text{Fe}$.....</i>	<i>29</i>
<i>Influences of Co-60 gamma irradiation on structural, optical and electrical characteristics of the amorphous and crystalline titanium oxide thin films.....</i>	<i>30</i>
<i>Investigating the dosimetry properties of two carbon nanostructures in the presence of a Co-60 irradiation source of radiation processing</i>	<i>31</i>
<i>Investigating radiation shielding properties of the nanocomposites including high density polyethylene and nano-oxide tungsten.....</i>	<i>32</i>
<i>A preliminary analysis of the dosimetry properties of nano-carbon structures in the presence of the electron beams at high doses levels</i>	<i>33</i>
<i>Radii and density calculations of ^{100}Mo by using Skyrme-Hartree-Fock method</i>	<i>34</i>
<i>The calculation of nuclear structure properties of ^{40}K</i>	<i>35</i>
<i>Different doped concrete samples</i>	<i>36</i>
<i>Neutron emission spectra of $^{90,94}\text{Zr}$ at 26.8 and 45.2 MeV alpha energies</i>	<i>37</i>
<i>Investigation of neutron emission spectra on some proton, deuteron and alpha particle incident reactions with different energies for ^{115}In isotope</i>	<i>38</i>
<i>Neutron emission spectra of $^{107,109}\text{Ag}$ isotopes for (p,xn) reactions at 18, 22 and 25 MeV proton incident energies</i>	<i>39</i>
<i>The effects of level density models on some proton induced reactions for ^{67}Cu production</i>	<i>40</i>
<i>Angular distribution of neutron emission spectra of ^{56}Fe in alpha induced reaction.....</i>	<i>41</i>
<i>Theoretical investigation of cross-section calculations for $^{62}\text{Ni}(p, \gamma)^{63}\text{Cu}$ and $^{63}\text{Cu}(\gamma, n)^{62}\text{Cu}$ reactions.....</i>	<i>42</i>
<i>The effect of geometric errors on dosimetric parameters in linear accelerator device</i>	<i>43</i>
<i>Monte carlo simulation of photon radiation transfer for 1D by using excel.....</i>	<i>44</i>
<i>Effect of bitter melon extract on uptake of radiolabeled-paclitaxel</i>	<i>45</i>
<i>Tritium concentrations in various water samples collected from Bolu province of Turkey.....</i>	<i>46</i>
<i>A study on accuracy of long term E-PERM system for indoor radon measurements.....</i>	<i>47</i>
<i>Determination of tritium concentrations in seawater samples along the east coastline before nuclear power plant in Sinop province.....</i>	<i>48</i>
<i>Cross-section calculations of $^{67}\text{Zn}(d, 2p)^{67}\text{Cu}$, $^{68}\text{Zn}(d, ^3\text{He})^{67}\text{Cu}$, $^{70}\text{Zn}(d, x)^{67}\text{Cu}$ and $^{nat}\text{Zn}(d, x)^{67}\text{Cu}$ reactions up to 50 MeV energy for medical ^{67}Cu radioisotope production</i>	<i>49</i>
<i>Production cross-section calculations of medical radioisotope ^{67}Cu for some (α, xp) and (α, x) reactions</i>	<i>50</i>
<i>An investigation on height dependence of atmospheric indoor radon concentration.....</i>	<i>51</i>
<i>A statistical evaluation of radon measurements for the bituminous coal mines in Turkey</i>	<i>52</i>
<i>A correlation study between atmospheric radon concentration and other mine parameters for 5 coal mines at the bituminous coal basin of Turkey</i>	<i>53</i>
<i>Investigation of the effect of ambient humidity on winding insulation resistance parameters in synchronous generators.....</i>	<i>54</i>
<i>Multi-purpose proton beam irradiation setup and beam characterization studies at TAEA-PAF.....</i>	<i>55</i>
<i>The radial investigation of radiation damage in structural material for thorium and minor actinide doped fluids in hybrid reactor</i>	<i>56</i>
<i>The effects on the heating of thorium and minor actinide doped fluids in hybrid reactor</i>	<i>57</i>
<i>Calculation neutron flux of uranium and minor actinide doped fluids in a hybrid reactor</i>	<i>58</i>
<i>Investigation of neutronic calculations in uranium and minor actinide doped fluids of a hybrid reactor using Monte Carlo method.....</i>	<i>59</i>

Calculation of radiation damage in structural material for uranium and minor actinide doped fluids using Monte Carlo method.....	60
The effect of uranium and minor actinide doped fluids on convert $^{238}\text{U}(n,\gamma)^{239}\text{Pu}$ using Monte Carlo method.....	61
Calculations of mean free path for ^{90}Zr shielding material at 14-15 MeV neutron incident energies	62
Calculations of absorption and reaction rate of iron ^{56}Fe target nuclei.....	63
Investigation of electromagnetic properties ^{182}W nucleus	64
Investigation of (n,p) and (γ ,p) reactions for fusion reactor shielding materials sn isotopes	65
Dosimetric verification with T-Ball cube phantom in radiationtherapy.....	66
Development of radiation measurement system for a laboratory-type thin layer radio chromatography.....	67
Effects of CT device parameters on imaging.....	68
Estimating thickness of the reflection layer Al_2O_3 of the NaI (TI) 3×3 detector	68
Validation Of code openmc by calculating K_{eff} of a slowpoke-2 reactor.....	70
Blue light sensitivity of calcium sulfate doped with rare earth elements using luminescence technique.....	71
Modeling of a HPGe detector using phits for the calculation of full energy peak efficiencies.....	72
The investigation of Bragg curve parameters and lateral scattering of proton and carbon beam in different energy in the water phantom.....	73
The computer simulation of vibrationally resolved luminescence spectra of important uranyl complex species	74
Fuel burnup calculations of the NHR5 reactor using DRAGON5 and DONJON5 deterministic codes	75
Radon and radium gas changes in the Ömer geothermal region.....	76
Radon and radium gas measurements in the Gecek geothermal region of Afyonkarahisar	77
Modeling a 3D magnetic sector analyzer for ion beam studies.....	78
Half-life values for first-forbidden transitions of the even-mass Au isotopes within pn-QRPA.....	79
Beta decay logft values for Pr, Nd, Sm, Gd isotopes in mass range $A=142$ by Pyatov's method	80
Implementation of the SN method in cartesian 2D geometry in a pedagogical tool to solve the neutron transport equation.....	81
Determination of photon kerma coefficients for CuO , CaO , SrCO_3 , PbO and Bi_2O_3 compounds	82
Thermal neutron scattering data for graphene	84
Calculation of nuclear reaction cross section of $^{46,47,49}\text{Ti}$ and ^{41}K nuclei induced by alpha particles.....	85
Solving the neutron transport equation by the spherical harmonics method (PN method)	86
Giant dipole resonance (GDR) in ^{235}U	87
A theoretical study of the low-lying electric dipole (E1) Strength in ^{163}Dy within the QRPA.....	88
Electric dipole structure of ^{192}Os in the 0-20 MeV energy range	89
Investigation of the electric dipole response of even-even deformed ^{154}Gd nucleus above neutron separation energy.....	90
Inelastic scattering of DT neutrons from ^{27}Al , ^{32}S targets	91
Activity concentrations of ^{137}Cs in some first exile tea samples grown in the central district of Rize province, Turkey.....	92
Accelerator based radionuclides/radiopharmaceuticals trends and TAEK-PAF.....	93
Research of the excitation functions of the $^{58}\text{Ni}(d,n+2p)$ reaction by level density model.....	94
The effect of level density models on the $^{58}\text{Ni}(n,x)^{57}\text{Co}$ reaction cross sections.....	95
Neutron absorption in B.....	96
Neutron absorption in FLiBe	97
A study on the effects of level density models for (g,n) and (g,2n) reactions on $^{120,122,124}\text{Sn}$ targets.....	98
A theoretical study for the elastic constants of platinum	99

<i>A theoretical investigation for the mechanical properties of platinum</i>	<i>100</i>
<i>Elastic constants of fcc palladium.....</i>	<i>101</i>
<i>Some mechanical properties of Fcc Palladium.....</i>	<i>102</i>
<i>Nucleon densities of Fe isotopes.....</i>	<i>103</i>
<i>Calculating the elastic constants of lead</i>	<i>104</i>
<i>Computing the mechanical properties of lead.....</i>	<i>105</i>
<i>Bohr hamiltonian for $\gamma=30^\circ$ with pseudo-harmonic potential</i>	<i>106</i>
<i>A solution of Bohr hamiltonian for $\gamma=0^\circ$ with pseudo-harmonic potential</i>	<i>107</i>
<i>Calculation of mass attenuation coefficients of Cu Doped ZnS thin film for radiation shielding by the Monte Carlo method</i>	<i>108</i>
<i>Magnetic phase transitions in low dimensional systems.....</i>	<i>109</i>
<i>Diffusion coefficients for certain moderators at thermal energy.....</i>	<i>110</i>
<i>Investigation of field size dependence of transmission properties of mega voltage X rays.....</i>	<i>111</i>
<i>Investigation of mass attenuation coefficients of $\text{Bi}_2\text{O}_3\text{B}_2\text{O}_3$ glass materials by using the Monte Carlo method</i>	<i>112</i>
<i>Investigation of neutron shielding behavior in B_4C /stainles steel 316L composite.....</i>	<i>113</i>
<i>Prominent investigation of temperature dependence of IRSL characteristics of sediment samples extracted from the sea of Marmara</i>	<i>114</i>
<i>A detailed research on the IRSL characteristics of sediment samples taken from the sea of Marmara at different temperatures</i>	<i>115</i>
<i>A review on shielding calculations by TAEK RSGD-KLV-006 and NCRP 147</i>	<i>116</i>
<i>Determination of the parameters of producing $^{210,211}\text{At}$ medical radioisotopes in cyclotron.....</i>	<i>117</i>
<i>Neutronic study of fuel depletion for the MNSR reactor using DRAGON5 code</i>	<i>118</i>
<i>To assess the CTDI value at cone beam computed tomography device by circular and elliptical cylinder phantoms.....</i>	<i>119</i>
<i>Usak area deep well water study on radon activity.....</i>	<i>120</i>
<i>Investigation of the efficiency of standard uptake values acquired by hybrid PET-CT imaging device.....</i>	<i>121</i>
<i>Comparison of gamma analyses by three different dosimetric systems in IMRT</i>	<i>122</i>
Participant Lists.....	123

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Dr. Zafer DEMİRCAN	Director, TAEK

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Prof. Dr. Jameel-Un NABI	GIK, Pakistan
Assoc. Prof. Dr. Betül ERTAN	Amasya University

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Dr. Ercan YILDIZ	Kırıkkale University
Dr. Yusuf KAVUN	Osmaniye Korkut Ata University
Dr. Hasan ÖZDOĞAN	Akdeniz University
Dr. Mert ŞEKERCİ	Süleyman Demirel University
Dr. Nurdan KARPUZ DEMİR	Amasya University
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Res. Asst. Mehmet Murat YAŞAR	Harran University
Selcan ŞAHİN	Akdeniz University
Hilal KABAĞCI	Akdeniz University

Scientific Committee

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Dr. Shahryar MALEKIE	Nuclear Science and Technology Research Institute, Iran
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Prof. Dr. Muhittin ŞAHAN	Osmaniye Korkut Ata University, Turkey
Prof. Dr. Güneş TANIR	Gazi University, Turkey
Dr. Mansoureh TATARI	Yazd University, Iran
Prof. Dr. Mustafa TOPAKSU	Çukurova University, Turkey
Prof. Dr. İlkey TÜRK ÇAKIR	Giresun University, Turkey
Prof. Dr. Andrea VITTURI	INFN, Italy
Prof. Dr. Sezai YALÇIN	Bitlis Eren University, Turkey
Prof. Dr. Zehra YEĞİNGİL	Çukurova University, Turkey

ID:109

Giant dipole resonance (GDR) in ^{235}U

Elif KEMAH, Sakarya University, Turkey
Hakan YAKUT, Sakarya University, Turkey
Emre TABAR, Sakarya University, Turkey

The giant dipole resonance (GDR), which is a universal phenomenon in all nuclei, has been theoretically investigated in ^{235}U nucleus. The theoretical tool in this study is the Quasiparticle Random Phase Approximation (QRPA) including a deformed Wood-Saxon potential, monopole pairing term, and separable dipole-dipole force. The computed dipole cross section in ^{235}U is in overall agreement with the available experimental data. Comparison of the obtained E1 spectra for ^{235}U with that of the core nucleus (^{234}U) indicates that valence nucleon plays the role of a spectator. Therefore, the main part of the theoretical E1 strength arise from one-quasiparticle $\otimes$ phonon configurations.

ID:110

A theoretical study of the low-lying electric dipole (E1) Strength in ^{163}Dy within the QRPA

Gamze HOŞGÖR, Sakarya University, Turkey
Emre TABAR, Sakarya University, Turkey

The low-lying electric dipole (E1) strength in deformed ^{163}Dy has been theoretically studied up to 4 MeV using the Quasiparticle Random Phase Approximation (QRPA). The model Hamiltonian includes the axially symmetric Wood-Saxon potential with monopole pairing as well as the residual dipole-dipole interaction. The parity assignment in the experiments on odd-mass deformed nuclei is impossible even now because of the anisotropic angular distributions. Therefore, magnetic dipole (M1) transitions cannot be distinguished from the E1 ones in odd-mass deformed nuclei. Comparison of the obtained E1 spectra for ^{163}Dy with the available experimental data shows that in addition to the M1 transitions, there is also considerable E1 strength in the low-lying dipole spectrum of ^{163}Dy . The M1 strength computed in our recent work, has not fill the full range of observation in this nucleus. By including the E1 spectrum, a fragmentation pattern comparable with experimental data is obtained. Furthermore, keeping in mind the experimental problems in odd-mass deformed nuclei, it can be concluded that the experimental radiation width is well reproduced.

Participant Lists

1. Afaf El MTILI, University Abdelmalek Essaadi, Morocco
2. Armin MOSAYEBI, Nuclear Science & Technology Research Institute, Iran
3. Assia ARECTOUT, Abdelmalek Essaadi University, Morocco
4. Fatiha KADEM, USTHB University, Algeria
5. Hafssa ZIANI, University Abdelmalek Essaadi, Morocco
6. Houda El YAAKOUBI, University Abdelmalek Essaadi, Morocco
7. Jakub VISNAK, Charles University in Prague, Czech Republic
8. Jamal Al ZAIN, Abdelmalek Essaadi University, Morocco
9. Maria V. CHUSHNYAKOVA, Omsk State Technical University, Russia
10. Mohamed LAHDOUR, Abdelmalek Essaadi University, Morocco
11. Mohammad Amin HOSSEINI, Shiraz University of Medical Sciences, Iran
12. Monia El BARBARI, Abdelmalek Essaadi University, Morocco
13. Nesrine MEZERREG, USTHB, Algeria
14. Ovidiu NITESCU, University of Bucharest, Romania
15. Shahryar MALEKIE, Nuclear Science and Technology Research Institute, Iran
16. Alpaslan KOCER, Süleyman Demirel University, Turkey
17. Abdullah AYDIN, Kırıkkale University, Turkey
18. Abdullah BAYINDIR, Afyonkarahisar, Turkey
19. Abdullah KAPLAN, Süleyman Demirel University, Turkey
20. Ahmet BÜLBÜL, Osmaniye Korkut Ata University, Turkey
21. Ali Armağan GÖK, Osmaniye Korkut Ata University, Turkey
22. Alper Nazmi YÜKSEL, Turkish Atomic Energy Authority, Turkey
23. Asiye GÜROL, Afyon Kocatepe University, Turkey
24. Aslı Melisa AĞAR, Giresun University, Turkey
25. Aysun İNAL, Antalya Eğitim ve Araştırma Hastanesi Radyasyon Onkolojisi, Turkey
26. Bayram DEMİR, İstanbul University, Turkey
27. Bekir ORUNCAK, Afyon Kocatepe University, Turkey
28. Berat ARAL, Selçuk University, Turkey
29. Betül CANIMKURBEY, Amasya University, Turkey
30. Betül ÇETİN, Amasya University, Turkey
31. Buket ÇEÇEN, Akdeniz University, Turkey
32. Burcu UÇAR, Gaziosmanpaşa University, Turkey
33. Cansu KAYAŞ, Ege University, Turkey
34. Coşkun HARMANŞAH, Ege University, Turkey
35. Dilay KİRAZ, MEB, Turkey
36. Elif KEMAH, Sakarya University, Turkey
37. Emine ALDIRMAZ, Amasya University, Turkey
38. Emre DEMİREL, Erzincan Binali Yıldırım University, Turkey
39. Emre GÜLER, Hitit University, Turkey
40. Ercan YILDIZ, Ministry of National Education, Turkey
41. Esra UYAR, Gazi University, Turkey
42. Eyyup TEL, Osmaniye Korkut Ata University, Turkey
43. Fatih EKİNCİ, Gazi University, Turkey
44. Fazilet Zümrüt BIBER MÜFTÜLER, Ege University, Turkey
45. Ferhan AKDENİZ, Akdeniz University, Turkey
46. Filiz KORKMAZ GÖRÜR, Abant İzzet Baysal University, Turkey
47. Gamze HOŞGÖR, Sakarya University, Turkey
48. Gizem BAKIR, Cumhuriyet University, Turkey
49. Gökçen İNAN, Selçuk University, Turkey
50. Gökmen ŞEKER, İnönü University, Turkey
51. Görkem TÜREMEN, Turkish Atomic Energy Authority, Turkey
52. Gül Naz BABAOĞLAN, Osmaniye TOBB High School, Osmaniye, Turkey
53. Gülşen TEL, Osmaniye, Turkey
54. Hasan BIRCAN, Kütahya Dumlupınar University, Turkey
55. Hasan GÜMÜŞ, Ondokuz Mayıs University, Turkey
56. Hasan ÖZDOĞAN, Akdeniz University, Turkey
57. Hasan ÜNLÜ, Gazi University, Turkey
58. Hatice BİLGİN, Afyon Kocatepe University, Turkey
59. Havva AKGÖNÜL, Süleyman Demirel University, Turkey
60. Hilal BARDAKÇI, İnönü University, Turkey
61. Hilal KABAKÇI Akdeniz University, Turkey

62. Hüseyin Ali YALIM, Afyon Kocatepe University, Turkey
63. İlayda TEL, Osmaniye Doğa Collage, Osmaniye, Turkey
64. İlkyay TÜRK ÇAKIR, Giresun University, Turkey
65. İsmail Hakkı SARPUN, Akdeniz University, Turkey
66. Kaan MANISA, Kütahya Dumlupınar University, Turkey
67. Kemal TAŞDÖVEN, Akdeniz University, Turkey
68. Mehmet BÜYÜKTÜRKMEN, MEB, Turkey
69. Mehmet ERDOĞAN, Selçuk University, Turkey
70. Mehmet Murat YAŞAR, Harran University, Turkey
71. Mehtap DÜZ, İnönü University, Turkey
72. Melek GÜLER, Hitit University, Turkey
73. Mert ŞEKERCI, Süleyman Demirel University, Turkey
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75. Mikail DIREKÇI, Gaziantep, Turkey
76. Murat ŞİRİN, Recep Tayyip Erdoğan University, Turkey
77. Necila ÇAKMAK, Karabuk University, Turkey
78. Nilay AKÇAY, Recep Tayyip Erdoğan University, Turkey
79. Nina TUNÇEL, Akdeniz University, Turkey
80. Nurdan KARPUZ DEMİR, Amasya University, Turkey
81. Nuri YORULMAZ, Harran University, Turkey
82. Özlem Yaşar TOYKAN ÇİFTLİKLİ, Akdeniz University, Turkey
83. Raci Ömer TURHAN, Osmaniye Korkut Ata University, Turkey
84. Rıdvan ÜNAL, Uşak University, Turkey
85. Sefa ERTÜRK, Niğde Ömer Halisdemir University, Turkey
86. Selcan ŞAHİN, Akdeniz University, Turkey
87. Şenol KAYA, Bolu Abant İzzet Baysal University, Turkey
88. Serdar BULUT, Turkish Atomic Energy Authority, Turkey
89. Serdar DİZMAN, Recep Tayyip Erdoğan University, Turkey
90. Serkan AKKOYUN, Sivas Cumhuriyet University, Turkey
91. Şevki ŞENTÜRK, Karadeniz Teknik Üniversitesi, Turkey
92. Telat AKSU, Ondokuz Mayıs University, Turkey
93. Telhat ÖZDOĞAN, Amasya University, Turkey
94. Tuğba DOĞAN, Osmaniye TOBB High School, Osmaniye, Turkey
95. Tuğçe GÜLÜMSER, Süleyman Demirel University, Turkey
96. Tuğçe YİĞİT, MEB, Turkey
97. Veysi GÜÇKAN, Cukurova University, Turkey
98. Vildan ÖZKAN BİLİCİ, Afyon Kocatepe University, Turkey
99. Yasemin SAVAŞ, Amasya University, Turkey
100. Yasin GAYLAN, Zonguldak Bülent Ecevit University, Turkey
101. Yusuf KAVUN, Kahramanmaraş Sütçü İmam University, Turkey
102. Yusuf ZALAOĞLU, Osmaniye Korkut Ata University, Turkey
103. Zehra YEĞİNGİL, Cukurova University, Turkey