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Education Information

Doctorate, Freie Universität Berlin, Fizik, Germany 2013 - 2017

Postgraduate, Freie Universität Berlin, Fizik, Germany 2010 - 2013

Undergraduate, Gebze Technical University, Faculty Of Basic Sciences, Department Of Physics, Turkey 2005 - 2009

Foreign Languages

German, B2 Upper Intermediate

French, A2 Elementary

English, B2 Upper Intermediate

Dissertations

Doctorate, Surface engineering of Cu(In,Ga)Se₂ by KF and CdS – A study by high-energy photoemission spectroscopy, Freie Universität Berlin, Fizik, 2017

Postgraduate, Electronic characteristics and transport mechanisms at chemical bath deposited-Zn(S,O)/Cu(In,Ga)(S,Se)₂ heterojunctions, Freie Universität Berlin, Fizik, 2012

Research Areas

Physics

Academic Titles / Tasks

Research Assistant PhD, Yozgat Bozok University, Fen-Edebiyat Fakültesi, Fizik, 2017 - Continues

Research Assistant PhD, Yozgat Bozok University, Bilim ve Teknoloji Uygulama ve Araştırma Merkezi, 2018 - 2019

Courses

Temel Fizik, Associate Degree, 2019 - 2020

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Impact of RbF post deposition treatment on CdS/CIGSe and Zn(O,S)/CIGSe interfaces-A comparative HAXPES study**
ÜMSÜR B., Maticiuc N., Kodalle T., Wenisch R., Majumdar I., Wang Y., Yetkin H. A., Bertram T., Kaufmann C. A., Schlatmann R., et al.
RENEWABLE ENERGY, vol.180, pp.626-636, 2021 (SCI-Expanded)
- II. **Depth-resolved analysis of the effect of RbF post deposition treatment on CIGSe with two different Cu concentrations**
Maticiuc N., Kodalle T., ÜMSÜR B., Bertram T., Wenisch R., Wang Y., Majumdar I., Yetkin H. A., Abou-Ras D., Schafer N., et al.
SOLAR ENERGY MATERIALS AND SOLAR CELLS, vol.226, 2021 (SCI-Expanded)
- III. **In situ investigation of as grown Cu(In,Ga)Se-2 thin films by means of photoemission spectroscopy**
Calvet W., Uemsuer B., Steigert A., Prietzel K., Greiner D., Kaufmann C. A., Unold T., Lux-Steiner M., Lauermann I.
JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A, vol.37, no.3, 2019 (SCI-Expanded)
- IV. **Cu(In, Ga)Se-2 surface treatment with Na and NaF: A combined photoelectron spectroscopy and surface photovoltage study in ultra-high vacuum**
Parvan V., Mizrak A., Majumdar I., Uemsuer B., Calvet W., Greiner D., Kaufmann C. A., Dittrich T., Avancini E., Lauermann I.
APPLIED SURFACE SCIENCE, vol.444, pp.436-441, 2018 (SCI-Expanded)
- V. **Valence and conduction band edges of selenide and sulfide-based kesterites-a study by x-ray based spectroscopy and ab initio theory**
Olar T., Manoharan A., Draxl C., Calvet W., ÜMSÜR B., Parvan V., Chacko B., Xie H., Saucedo E., Valle-Rios L. E., et al.
SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol.32, no.10, 2017 (SCI-Expanded)
- VI. **Surface modifications of Na and K metal incorporated Cu(In,Ga)Se₂ absorbers investigated by synchrotron-based spectroscopies**
Majumdar I., ÜMSÜR B., Chacko B., Greiner D., Lux-Steiner M. C., Schlatmann R., Lauermann I.
PHYSICA STATUS SOLIDI C: CURRENT TOPICS IN SOLID STATE PHYSICS, VOL 14 NO 5, vol.14, no.10, 2017 (SCI-Expanded)
- VII. **Investigation of the potassium fluoride post deposition treatment on the CIGSe/CdS interface using hard X-ray photoemission spectroscopy - a comparative study**
Uemsuer B., Calvet W., Steigert A., Lauermann I., Gorgoi M., Prietzel K., Greiner D., Kaufmann C. A., Unold T., Lux-Steiner M. C.
PHYSICAL CHEMISTRY CHEMICAL PHYSICS, vol.18, no.20, pp.14129-14138, 2016 (SCI-Expanded)
- VIII. **Correlating the Local Defect-Level Density with the Macroscopic Composition and Energetics of Chalcopyrite Thin-Film Surfaces**
Broeker S., Kueck D., Timmer A., Lauermann I., Uemsuer B., Greiner D., Kaufmann C. A., Moenig H.
ACS APPLIED MATERIALS & INTERFACES, vol.7, no.23, pp.13062-13072, 2015 (SCI-Expanded)
- IX. **Locally resolved investigation of wedged Cu(In,Ga)Se-2 films prepared by physical vapor deposition using hard X-ray photoelectron and X-ray fluorescence spectroscopy**
Calvet W., Uemsuer B., Hoepfner B., Lauermann I., Prietzel K., Kaufmann C. A., Unold T., Lux-Steiner M. C.
THIN SOLID FILMS, vol.582, pp.361-365, 2015 (SCI-Expanded)
- X. **Investigation of Cu-poor and Cu-rich Cu(In,Ga)Se-2/CdS interfaces using hard X-ray photoelectron spectroscopy**
Uemsuer B., Calvet W., Hoepfner B., Steigert A., Lauermann I., Gorgoi M., Prietzel K., Navirian H. A., Kaufmann C. A., Unold T., et al.
THIN SOLID FILMS, vol.582, pp.366-370, 2015 (SCI-Expanded)
- XI. **Assessment of chemical and electronic surface properties of the Cu₂ZnSn(SSe)(4) after different etching procedures by synchrotron based spectroscopies**
Olar T., Lauermann I., Xie H., Neuschitzer M., Saucedo E., Calvet W., Steigert A., ÜMSÜR B., Chacko B., Parvan V., et al.
PROCEEDINGS OF THE EMRS 2015 SPRING MEETING - SYMPOSIUM C ON ADVANCED INORGANIC MATERIALS AND STRUCTURES FOR PHOTOVOLTAICS, vol.84, pp.8-16, 2015 (SCI-Expanded)

Refereed Congress / Symposium Publications in Proceedings

- I. **Impact of RbF Post Deposition Treatment on CdS/CIGSe and Zn(O,S)/CIGSe Interfaces – A Comparative HAXPES Study**
ÜMSÜR B., Maticiu N., Kodalle T., Majumdar I., Wang Y., Wenisch R., Yetkin H. A., Bertram T., Kaufmann C. A., Schlatmann R., et al.
2nd International Conference on Photovoltaic Science and Technologies (PVCon2020), 30 November - 02 December 2020
- II. **Surface Modification of Na and K Incorporated Cu(In,Ga)Se₂ Absorbers Investigated by Synchrotron Based Spectroscopies**
Majumdar I., ÜMSÜR B., Chacko B., Parvan V., Greiner D., Lux-Steiner M. C., Schlatmann R., Lauermann I.
E-MRS Spring Meeting, Strasbourg, France, 22 - 26 May 2017
- III. **XPS Analysis of Cd Diffusion into Cu-poor and Cu-rich Cu(In,Ga)Se₂ Solar Cell Absorbers**
ÜMSÜR B., Calvet W., Bercegol A., Steigert A., Kiss J., Mirhosseini H., Gorgoi M., Greiner D., Kaufmann C. A., Lux-Steiner M. C., et al.
1st International Underground Resources and Energy Conference, Yozgat, Turkey, 6 - 08 October 2016
- IV. **Depth profiled XPS analysis and NEXAFS study of Na, K-PDT on CIGSe as a function of deposition temperature using synchrotron radiation**
Majumdar I., ÜMSÜR B., Heinemann M. D., Chacko B., Smirnov D., Calvet W., Parvan V., Mızrak A. V., Lauermann I.
MSE Congress, Darmstadt, Germany, 27 - 29 September 2016
- V. **Analysis of surface composition and device performance of UHV and air-transferred CIGSe thin film solar cell absorbers on alkali-containing substrate glass**
Calvet W., Majumdar I., ÜMSÜR B., Steigert A., Chacko B., Parvan V., Kaufmann C. A., Greiner D., Lauche J., Navirian H. A., et al.
32nd European Photovoltaic Solar Energy Conference and Exhibition, Munich, Germany, 20 - 24 June 2016
- VI. **The band edges development in Cu₂ZnSn(S,Se)₄ with different [S]/([S][Se]) ratios tackled with synchrotron-based spectroscopy**
Olar T., Lauermann I., Manoharan A., Pardini L., Hannewald K., Draxl C., Xie H., Saucedo E., Calvet W., Steigert A., et al.
E-MRS Spring Meeting, Lille, France, 2 - 06 May 2016
- VII. **In-situ characterization of solar cells using synchrotron techniques**
Lauermann I., Mainz R., Calvet W., ÜMSÜR B., Olar T., Steigert A., Lux-Steiner M. C.
E-MRS Spring Meeting, Lille, France, 2 - 06 May 2016
- VIII. **The impact of thin KF, NaF, K, and Na layers on CIGS studied with SPV and XPS/UPS**
Parvan V., Mızrak A. V., ÜMSÜR B., Calvet W., Steigert A., Lauermann I., Dittrich T., Greiner D., Kaufmann C. A., Lux-Steiner M. C.
E-MRS Spring Meeting, Lille, France, 2 - 06 May 2016
- IX. **Electronic and chemical surface properties of kesterite with different [S]/([S][Se]) ratios tackled by the synchrotron-based spectroscopies**
Olar T., Lauermann I., Xie H., Saucedo E., Calvet W., Steigert A., ÜMSÜR B.
Kesterite European Meeting, Newcastle, Australia, 19 - 20 November 2015
- X. **Comparison of surface composition, electronic properties, and solar cell performance of UHV-transferred and air exposed CIGSe thin film solar cell absorbers**
Calvet W., ÜMSÜR B., Steigert A., Lauermann I., Chacko B., Parvan V., Olar T., Prietzel K., Navirian H. A., Brunken S., et al.
31st European Photovoltaic Solar Energy Conference and Exhibition, Hamburg, Germany, 14 - 18 September 2015
- XI. **Diffusion of indium in kesterite thin-film solar cells investigated by hard x-ray photoelectron spectroscopy**
Olar T., Lauermann I., Xie H., Saucedo E., Calvet W., Steigert A., ÜMSÜR B., Lux-Steiner M. C.
The 562nd Wilhelm and Else Heraeus-Seminar "From Sunlight to Fuels", Bad-Honnef, Germany, 11 May 2014 - 16 May 2015

- XII. **Assessment of the Cu₂ZnSnS₄ chemical and electronic surface properties after different etching procedures by synchrotron-based spectroscopies**
Olar T., Lauermann I., Xie H., Saucedo E., Calvet W., Steigert A., ÜMSÜR B., Chacko B., Parvan V., Lux-Steiner M. C.
E-MRS Spring Meeting, Lille, France, 11 - 15 May 2015
- XIII. **Investigation of the potassium fluoride-post deposition treatment on the CIGS/CdS interface using hard x-ray photoemission spectroscopy – a comparative study**
ÜMSÜR B., Calvet W., Steigert A., Lauermann I., Gorgoi M., Prietzel K., Greiner D., Kaufmann C. A., Unold T., Lux-Steiner M. C.
E-MRS Spring Meeting, Lille, France, 11 - 15 May 2015
- XIV. **Comparison of surface composition, electronic properties, and solar cell performance of UHV-transferred and air exposed CIGSe thin film solar cell absorbers.**
Calvet W., ÜMSÜR B., Steigert A., Lauermann I., Chacko B., Parvan V., Olar T., Prietzel K., Navirian H. A., Brunken S., et al.
E-MRS Spring Meeting, Lille, France, 11 - 15 May 2015
- XV. **Investigation of KF-PDT on the CIGSe/CdS interface using hard x-ray photoemission spectroscopy**
ÜMSÜR B., Calvet W., Höpfner B., Steigert A., Lauermann I., Gorgoi M., Prietzel K., Brunken S., Greiner D., Kaufmann C. A., et al.
SolarTR-3, Ankara, Turkey, 27 - 29 April 2015
- XVI. **Assessment of the Cu₂ZnSnS₄ surface properties after different etching procedures by x-ray, ultraviolet and hard x-ray photoelectron spectroscopies**
Olar T., Lauermann I., Xie H., Saucedo E., Calvet W., Steigert A., ÜMSÜR B.
Kesterite European Meeting, Talin, Armenia, 13 - 14 November 2014
- XVII. **The impact of pre-and post-deposition sodium fluoride treatments on CIGSe absorbers and solar cell performance - a comparative study using surface and bulk sensitive analysis tools**
Calvet W., ÜMSÜR B., Steigert A., Lauermann I., Prietzel K., Navirian H. A., Brunken S., Kaufmann C. A., Unold T.
29th European Photovoltaic Solar Energy Conference and Exhibition, Amsterdam, Netherlands, 22 - 26 September 2014
- XVIII. **Thickness dependent investigation of wedged Cu(In,Ga)Se₂ films prepared by physical vapor deposition (PVD) using hard x-ray photoelectron spectroscopy (HAXPES)**
Calvet W., ÜMSÜR B., Steigert A., Höpfner B., Lauermann I., Prietzel K., Kaufmann C. A., Unold T., Lux-Steiner M. C.
E-MRS Spring Meeting, Lille, France, 26 - 30 May 2014
- XIX. **Investigation of Cu-poor and Cu-rich Cu(In,Ga)Se₂/CdS interfaces using hard x-ray photoelectron spectroscopy (HAXPES)**
ÜMSÜR B., Calvet W., Steigert A., Höpfner B., Lauermann I., Prietzel K., Kaufmann C. A., Unold T., Lux-Steiner M. C.
E-MRS Spring Meeting, Lille, France, 26 - 30 May 2014
- XX. **Thickness dependent investigation of wedged Cu(In,Ga)Se₂ films prepared by physical vapor deposition (PVD) using hard x-ray photoelectron spectroscopy (HAXPES)**
Calvet W., ÜMSÜR B., Steigert A., Höpfner B., Lauermann I., Prietzel K., Kaufmann C. A., Unold T., Lux-Steiner M. C.
The 562nd Wilhelm and Else Heraeus-Seminar "From Sunlight to Fuels", Bad-Honnef, Germany, 11 - 16 May 2014
- XXI. **Synchrotron-based analysis of the Cu(In,Ga)Se₂/CdS and Cu(In,Ga)Se₂/ZnS interfaces using soft x-ray photoemission spectroscopy (SXPS) and near edge x-ray absorption fine structure spectroscopy (NEXAFS)**
ÜMSÜR B., Calvet W., Höpfner B., Steigert A., Lauermann I., Lux-Steiner M. C.
International Conference on Solar Energy for World Peace, İstanbul, Turkey, 17 - 19 August 2013
- XXII. **Development of chemical bath deposited Zn(S,O) buffer layer for cadmium free Cu-chalcopyrite thin film solar cells during the NeuMaS project**
Ennaoui A., Lauermann I., ÜMSÜR B., Hergert F., Kasper W., Hahn T., Flückiger A.
27th European Photovoltaic Solar Energy Conference and Exhibition, Frankfurt, Germany, 24 - 28 September 2012

Metrics

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