

Forschungszentrum Jülich

Wissenschaftlicher Ergebnisbericht 2007

1.1 Erneuerbare Energien

Publikationen in begutachteten Zeitschriften

Astakhov O., Finger F., Carius R., Lambertz A., Petrusenko Y.*, Borysenko V.*, Barankov D.*
Electron spin resonance in thin film silicon after low temperature electron irradiation
Thin Solid Films, 515 (2007), 7513 - 7516
P11

Beigman I.*, Pospieszczyk A., Sergienko G., Tolstikhina I. Yu.*, Vainshtein L.
Tungsten spectroscopy for the measurement of W-fluxes from plasma facing components
Plasma Physics and Controlled Fusion, 49 (2007), 1833 - 1747
P11

Berginski M., Hüpkes J., Schulte M., Schöpe G., Stiebig H., Rech B., Wuttig M.*
The effect of front ZnO:Al surface texture and optical transparency on efficient light trapping in silicon thin-film solar cells
Journal of Applied Physics, 101 (2007), 074903-01 - 074903-11
P11

Beyer W., Hüpkes J., Stiebig H.
Transparent conducting oxide films for thin film silicon photovoltaics
Thin Solid Films, 516 (2007) 2/4, 147 - 154
P11

Bittkau K., Carius R.
Near-field study of optical modes in randomly textured ZnO thin films
Superlattices and Microstructures, 42 (2007), 47 - 51
P11

Bittkau K., Carius R., Lienau C.*
Guided optical modes in randomly textured ZnO thin films imaged by near-field scanning optical microscopy
Physical Review B, 76 (2007), 035330
P11

Bronger T., Carius R.
Carrier mobilities in microcrystalline silicon films
Thin Solid Films, 515 (2007) 19, 7486 - 7489
P11

Bronsveld P. C. P.*, van der Wagt H. J.*, Rath J. K.*, Schropp R. E. I.*, Beyer W.
Post-deposition thermal annealing studies of hydrogenated microcrystalline silicon deposited at 40° C
Thin Solid Films, 515 (2007), 7495 - 7498
P11

Chan K. Y., Bunte E., Knipp D., Stiebig H.
Microcrystalline silicon thin-film transistors for large area electronic applications
Semiconductor Science and Technology, 22 (2007), 1213 - 1219
P11

Chan K. Y., Bunte E., Stiebig H., Knipp D.*
Influence of low temperature thermal annealing on the performance of microcrystalline silicon thin-film transistors
Journal of Applied Physics, 101 (2007), 074503
P11

Dingemans G., van den Donker M. N., Gordijn A., Kessel W. M. M.*, van de Sanden M. C. M.*
Probing the phase composition of silicon films in situ by etch product detection
Applied Physics Letters, 91 (2007), 161902
P11

Einsele F., Rostan P. J., Schubert M. B., Rau U.
Recombination and Resistive Losses at ZnO/a-Si:H/c-Si Interfaces in Heterojunction Back Contacts for Silicon Solar Cells
Journal of Applied Physics, 102 (2007), 094507
P11

Finger F., Carius R., Geng X.*, Klein S., Mai Y., Sendova-Vassileva M.
Deposition processes for high efficiency microcrystalline silicon solar cells
Journal of Optoelectronics and Advanced Materials, 9 (2007), 92 - 98
P11

Haase C., Stiebig H.
Thin-film silicon solar cells with efficient periodic light trapping texture
Applied Physics Letters, 91 (2007), 061116
P11

Hamers E. A. G.*, Van den Donker M. N., Stannowski B.*, Schlatmann R.*, Jongerden G. J.*
Helianthos: Roll-to-Roll Deposition of Flexible Solar Cell Modules
Plasma Processes and Polymers, 4 (2007) 3, 275 - 281
P11

Hoeb M.*, Rädler J. O.*, Klein S., Stutzmann M.*, Brandt M. S.*
Light-Induced Dielectrophoretic Manipulation of DesoxyriboNucleinAcid
Biophysical Journal, 93 (2007), 1032 - 1038
P11

Huang Y. L., Simoen E.*, Claeys C.*, Rafi J. M.*, Clauws P.*
A DLTS study on plasma-hydrogenated n-type high-resistivity magnetic Cz silicon
Journal of Materials Science - Materials in Electronics, 18 (2007), 705 - 710
P11

Huang Y., Dasgupta A., Gordijn A., Finger F., Carius R.
Highly transparent microcrystalline silicon carbide grown with hot wire chemical vapor deposition as window layers in n-i-p microcrystalline silicon solar cells
Applied Physics Letters, 90 (2007), 203502
P11

Kirchartz T., Rau U.
Electroluminescence analysis of high efficiency Cu (In, Ga) Se₂ solar cells
Journal of Applied Physics, 102 (2007), 104510
P11

Klein S., Finger F., Carius R., Dylla T., Klomfass J.
Relationship between the optical absorption and the density of deep gap states in microcrystalline silicon
Journal of Applied Physics, 102 (2007), 103501
P11

Liang Y., Koslowski H. R., Thomas P. R.*, Nardon E.*, Jachmich S.*, Alper B.*, Andrew P.*, Andrew Y.*, Arnoux G.*, Baranov Y.*, Bécoulet M.*, Beurskens M.*, Biewer T.*, Bigi M.*, Crombé K.*, De La Luna E.*, de Vries P.*, Eich T.*, Esser H. G., Fundamenski W.*, Gerasimov S.*, Giroud C.*, Gryaznevich M. P.*, Harting D., Hawkes N.*, Hotchin S.*, Howell D.*, Huber A., Jakubowski M., Kiptily V.*, Kreter A., Moreira L.*, Parail V.*, Pinches S. D.*, Rachlew E.*, Schmitz O., Zimmermann O.
Active control of type-I edge localized modes on JET
Plasma Physics and Controlled Fusion, 49 (2007), B581 - B589
P11

Premkumar P. A.*, Kuppusami P.*, Dasgupta A., Mallika C.*, Nagaraja K. S.*, Raghunathan V. S.*
Plasma assisted chemical vapour deposition of Cr coatings using chromium (III) acetylacetonate vapour source
Materials Letters, 61 (2007) 1, 50 - 53
P11

Rau U.
Reciprocity Relation between Photovoltaic Quantum Efficiency and Electroluminescent Emission of Solar Cells
Physical Review B, 76 (2007), 085303
P11

Reynolds S.*, Aneva Z.*, Levi Z.*, Nesheva D.*, Main C.*, Smirnov V.
Potential gas sensor applications of semiconductor thin films based on changes in photoresponse
Journal of Optoelectronics and Advanced Materials, 9 (2007), 209 - 212
P11

Rockstuhl C.*, Lederer F.*, Bittkau K., Carius R.
Light localization at randomly textured surfaces for solar-cell applications
Applied Physics Letters, 91 (2007), 171104
P11

Saleh R.*, Munisa L.*, Beyer W.
Hydrogen induced voids in hydrogenated amorphous silicon carbon (a-SiC:H): Results of effusion and diffusion studies
Applied Surface Science, 253 (2007), 5334 - 5340
P11

Schulze K.*, Maenning B.*, Leo K.*, Tomita Y.*, May C.*, Hüpkes J., Brier E.*, Egon R.*, Bäuerle P.*
Organic solar cells on indium tin oxide and aluminium doped zinc oxide anodes
Applied Physics Letters, 91 (2007), 073521
P11

Stiebig H., Moulin E., Rech B.
Photodetectors based on amorphous and microcrystalline silicon
Thin Solid Films, 515 (2007) 19, 7522 - 7525
P11

Tsvetkova T.*, Sellin P.*, Carius R.
High-energy He⁺-ion beam induced modification in a-SiC:H
Journal of Optoelectronics and Advanced Materials, 9 (2007), 375 - 378
P11

Van den Donker M. N., Rech B., Kessels W. M. M.*, van de Sanden M. C. M.*
Transient depletion of source gases during materials processing: a case study on the plasma deposition of microcrystalline silicon
New Journal of Physics, 9 (2007), 280
P11

Van den Donker M., Klein S., Rech B., Finger F., Kessels W. M. M.*, van de Sanden M. C. M.*
Microcrystalline silicon solar cells with an open-circuit voltage above 600mV
Applied Physics Letters, 90 (2007), 183504
P11

Van den Donker M., Rech B., Finger F., Houben L., Kessels W. M. M.*, van de Sanden M. C. M.*
Deposition of Highly Efficient Microcrystalline Silicon Solar Cells under Conditions of Low H₂ Dilution: the Role of the Transient Depletion Induced Incubation Layer
Progress in Photovoltaics : Research and Applications, 15 (2007), 291 - 301
P11

Van den Donker M., Rech B., Schmitz R., Klomfass J., Dingemans G., Finger F., Houben L., Kessels W. M. M.*, van de Sanden M. C. M.*
Hidden parameters in the plasma deposition of microcrystalline silicon solar cells deposited at high rates
Journal of Materials Research, 22 (2007), 1767 - 1774
P11

van den Donker M. N., Gordijn A., Stiebig H., Finger F., Rech B., Stannowski B.*, Bartl R.*, Hamers E. A. G.*, Schlatmann R.*, Jongerden G. T.*
Flexible amorphous and microcrystalline silicon tandem solar modules in the temporary superstrate concept
Solar Energy Materials and Solar Cells, 91 (2007), 572 - 580
P11

FZJ referierte Publikationen

Astakhov O., Carius R., Petrusenko Y.*, Borysenko V.*, Barankov D.*, Finger F.
Defects in thin film silicon at the transition from amorphous to microcrystalline structure
Physica Status Solidi - Rapid Research Letters, 1 (2007) 2, R77 - R79
P11

Sonstige Publikationen

Astakhov O., Carius R., Petrusenko Y.*, Borysenko V.*, Barankov D.*, Finger F.
Spin Density in Thin Film Silicon before and after Electron Bombardment
Amorphous and Polycrystalline Thin-Film Silicon Science and Technology - 2007 / ed.: V. Chu, S. Miyazaki, A. Nathan, J. Yang, H.-W. Zan. - Warrendale, PA, MRS, 2007. - (Materials Research Society Symposium proceedings ; 989). - S. A02-03
P11

Becker C.*, Hänel T.*, Gorka B.*, Lee K.*, Dogan P.*, Fenske F.*, Berginski M., Hüpkes J., Gall S.*, Rech B.*
Solid phase crystallization of amorphous silicon on ZnO:Al for thin film solar cells
Technical Digest of the 17th International Photovoltaic Science and Engineering Conference (PVSEC-17), Fukuoka, Japan, 3.-7. December 2007. - 2007. - S. 1122 - 1123
P11

Berginski M., Das C., Doumit A., Hüpkes J., Rech B., Wuttig M.*
Properties of TiO₂ layers as antireflection coating for amorphous silicon based thin-film solar cells
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan, Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 2079 - 2083
P11

Berginski M., Hüpkes J., Gordijn A., Reetz W., Wätjen T., Wuttig M.*
Experimental studies of the light trapping and optical losses in microcrystalline silicon solar cells
Technical Digest of the 17th International Photovoltaic Science and Engineering Conference (PVSEC-17), Fukuoka, Japan, 3.-7. December 2007. - 2007. - S. 341 - 342
P11

Beyer W., Niessen L., Pennartz F.
Boron doping effects in microcrystalline silicon
Amorphous and Polycrystalline Thin-Film Silicon Science and Technology - 2007 / ed.: V. Chu, S. Miyazaki, A. Nathan, J. Yang, H.-W. Zan. - Warrendale, PA, MRS, 2007. - (Materials Research Society Symposium proceedings ; 989). - S. A07-07
P11

Bunte E., Hüpkes J., Zhu H., Berginski M., Siekmann H., Appenzeller W., Rech B.
Aluminium-Doped Zinc Oxide Films for Silicon Thin-Film Solar Cells prepared by Sputter Deposition from Rotatable Ceramic Targets
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan, Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 2173 - 2177
P11

Chan K. Y., Bunte E., Stiebig H., Knipp D.*

Contact Effects in High Mobility Microcrystalline Silicon Thin-Film Transistors

Amorphous and Polycrystalline Thin-Film Silicon Science and Technology - 2007 / ed.: V. Chu, S. Miyazaki, A. Nathan, J. Yang, H.-W. Zan. - Warrendale, PA, MRS, 2007. - (Materials Research Society Symposium proceedings ; 989). - S. A11-03

P11

Chan K. Y., Bunte E., Stiebig H., Knipp D.*

High mobility microcrystalline silicon thin-film transistors fabricated at temperature below 200°C

Proceedings of the Asia Display 2007 Conference, Shanghai, China, March 12-16, 2007. - 2007. - S. 589

P11

Das C., Berginski M., Doumit A., Lambertz A., Finger F., Gordijn A., Stiebig H., Hüpkes J., Kirchhoff J., Reetz W.

Performance of Superstrate Multijunction Amorphous Silicon Based Solar Cells Using Optical Layers for Current Management

Technical Digest of the 17th International Photovoltaic Science and Engineering Conference (PVSEC-17), Fukuoka, Japan, 3.-7. December 2007. - 2007. - S. 329 - 330

P11

Das C., Berginski M., Hüpkes J., Gordijn A., Kirchhoff J., Reetz W., Lambertz A., Finger F., Beyer W.

Improvement of Short-Circuit Current in Multijunction a-Si Based Solar Cells Using TiO₂ Anti-Reflection Layer

Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference) 2007, Milan, Italy, 03.09.2007-07.09.2007. - 2007. - S. 2112 - 2114

P11

Dingemans G.

Microcrystalline silicon solar cells: Monitoring the phase composition in-situ by optical emission spectroscopy

Jülich, FZJ, Institut für Energieforschung 5, 2007

Eindhoven, Univ. of Technol., Dipl., 2007

P11

Dingemans G., van den Donker M. N., Hrunski D., Gordijn A., Kessels W. M. M., van de Sanden M. C. M.

In-Situ Film Transmittance Using the Plasma as Light Source: A Case Study of Thin Silicon Film Deposition in the Microcrystalline Growth Regime

Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan/Italy, 03.09.2007 - 07.09.2007. - S. 1855 - 1858

P11

Einsele F.*, Rostan P. J.*, Rau R.

Resistive Losses at c-Si/a-Si:H/ZnO Contacts for Heterojunction Solar Cells

Amorphous and Polycrystalline Thin-Film Silicon Science and Technology - 2007 / ed.: V. Chu, S. Miyazaki, A. Nathan, J. Yang, H.-W. Zan. - Warrendale, PA, MRS; 2007. - (Materials Research Society Symposium proceedings ; 989). - S. A18-04

P11

Gordijn A., Pollet-Villard A., van den Donker M. N., Wolff J., Finger F.

Influence of the Gas Flow Geometry on the Performance of Microcrystalline Silicon p-i-n Solar Cells

Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan/Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 2222 - 2225

P11

Haas S., Schöpe G., Gordijn A., Stiebig H.

Influence of the Laser Patterning Parameters on Thin-Film Silicon Module Properties

Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan/Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 2145 - 2151

P11

Huang Y., Gordijn A., Finger F., Dasgupta A., Hüpkes J., Reetz W., Carius R.
N-Side Illuminated Nip Microcrystalline Silicon Solar Cells With Microcrystalline Silicon Carbide Window Layers Grown Via HWCVD at Low Temperature
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan/Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 2154 - 2157
P11

Krantz S.
Einfluss von Stickstoff auf die reactive Sputterdeposition von aluminiumdotierten Zinkoxidschichten für Si-Dünnschichtszellen
Jülich, FZJ, Institut für Energieforschung 5, 2007
Aachen, RWTH, Dipl., 2007
P11

Lambertz A., Dasgupta A., Reetz W., Gordijn A., Carius R., Finger F.
Microcrystalline Silicon Oxide as Intermediate Reflector for Thin Film Silicon Solar Cells
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), 2007, Milan/Italy, 03.09.2007-07.09.2007. - 2007. - S. 1839 - 1842
P11

Lee K. Y.*, Becker C.*, Muske M.*, Gall S.*, Rech B.*, Gordon I.*, D'Haen J.*, Berginski M., Hüpkes J.
Poly-Si Films Grown On ZnO:Al Coated Glass by Aluminium-Induced Layer Exchange Process
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan, Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 2028 - 2032
P11

Mai Y.
Microcrystalline silicon layers for thin film solar cells prepared with Hot Wire Chemical Vapour Deposition and Plasma Enhanced Chemical Vapour Deposition
Jülich, Forschungszentrum, Zentralbibliothek, 2007
Berichte des Forschungszentrums Jülich ; 4254
JUEL-4254
Tianjin, VR China, Nankai Univ., Diss., 2006
P11

Mueller T.*, Schwertheim M.*, Scherff M.*, Zastrow U., Huang Y., Fahrner W. R.*
Crystalline silicon surface passivation by PECVD-deposited hydrogenated amorphous silicon oxide layers (a-SiO_x:H)
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan, Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 1552 - 1555
P11

Raissi M.*, Regula G.*, Belgacem C. H.*, Coudreau C.*, Nitsche S.*, Lancin M.*, Holländer B., Robert F.*, Fnaiech M.*, Ntsoenzok E.*, Lazzari J.-L.*
Nanocavity buffer induced by gas ion implantation in silicon substrate for strain relaxation of heteroepitaxial Si_{1-x}Ge_x/Si thin layers
Semiconductor defect engineering - Materials, Synthetic Structures and Devices II. - Warrendale, PA, MRS, 2007. - (Materials Research Society Symposium proceedings ; 994). - S. F11-08
P11

Schulte M., Jorke S., Zahren C., Hüpkes J., Stiebig H.
Analysis of the Scattering Properties of Textured TCO Structures for Thin Film Silicon Solar Cells
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan, Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 2190 - 2195
P11

Stiebig H., Haas S., Reetz W., Gordijn A., Hüpkes J., Beyer W.
Long Term Stability of Thin-Film Silicon Cells and Modules
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan/Italy, 03.09.2007 - 07.09.2007. - 2007. - S. 1827 - 1831
P11

Strobel C.*, Zimmermann T.*, Albert M.*, Bartha J. W.*, Beyer W., Kuske J.*

Investigation on layer properties of amorphous and microcrystalline silicon deposited with moving substrates in combination with a VHF linear plasma source designed for the fabrication of large area devices
Proceedings of the 22nd EUPVSEC (European Photovoltaic Solar Energy Conference), Milan, Italy,
03.09.07 - 07 09 2007. - 2007. - S. 2062 - 2067

P11