Materials Engineer / Materiálový inžinier 2007 – 2011
ISSN 1337 – 8953
www.materialing.com
V. Girman, 28. 03. 2011

SKRATKY V ELEKTRÓNOVEJ MIKROSKOPII

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Abstrakt
Cieľom príspevku je poskytnúť abecedný zoznam skratiek, ktoré sa často alebo ojedinele vyskytujú v odborných textoch o elektrónovej mikroskopii a jej technikách. Slovné rozpísanie skratiek zostáva v angličtine, keďže nie všetko je možné vysvetliť troma – štyrmi slovami. Do zoznamu boli zahrnuté aj skratky týkajúce sa niektorých analýz a ich matematického aparátu.

A

A/D – Analog to Digital converter
ACF – Absorption Correction Factor
ACSEM – Aberration Corrected Scanning Electron Microscope
ADC – Analog to Digital Converter
ADF – Annular Dark Field detector
AE – Auger Electrons
AEE – Auger Electron Emission
AEEM – Auger Electron Emission Microscopy
AEES – Auger Electron Emission Spectroscopy
AEM – Analytical Electron Microscopy
AES – Auger Electron Spectroscopy
AFF – Aberration Free Focus
AFM – Atomic Force Microscopy
AHL – Atom Holographic Lithography
AIP – Achromatic Image Plane
ALCHEMI – Atom Location by Channeling Enhanced Microanalysis
AM-AFM – Amplitude Modulated Atomic Force Microscopy
APB – Anti Phase domain Boundary
ARPES – Angle Resolved Photoemission Spectroscopy
ART – Algebraic Reconstruction Techniques
ASEM – Atmospheric Scanning Electron Microscopy
ATEM – Analytical Transmission Electron Microscopy
ATW – Atmospheric Thin Window

B

BEEM – Balistic Electron Emission Microscopy
BEI – Backscattered Electrons Imaging
BF – Bright Field
BFP – Back Focal Plane
BSE – Back Scattered Electrons
BSED – Back Scattered Electron Diffraction (Detector)
BZB – Brillouin Zone Boundary

C

C-AFM – Conductive Atomic Force Microscopy
CBED – Convergent Beam Electron Diffraction
CBI – Convergent Beam Illumination
CBIM – Convergent Beam Imaging
CC – Camera Constant
CCD – Charge Coupled Device
CCF – Cross Correlation Function
CCM – Charge Collection Microscopy
CCS – Concentric Cone Spectrometer
CDF – Centered Dark Field
CE – Collection Efficiency
CET – Cryoelectron Tomography
CF – Coherent Fresnel (Foucault)
CFEG – Cold Field Emission Gun
CHA – Concentric Hemispherical Analyzer
ChX-rays – Characteristic X-rays
CITS – Current Imaging Tunneling Spectroscopy
CL – Cathodoluminescence

CMA – Cylindrical Mirror Analyzer
CRT – Cathode Ray Tube
CSEM – Conventional Scanning Electron Microscopy
CTEM – Conventional Transmission Electron Microscope
CTF – Contrast Transfer Function
CX-rays – Continuous X-rays
CXDI – Coherent X-ray Diffractive Imaging

D

D/A – Digital to Analogue converter
DAC – Digital to Analogue converter
DD – Double Diffraction
DE – Diffracted Electrons
DECO – Doubly Symmetrical Electrostatic Corrector
DF – Dark Field
DI – Diffractive Imaging
DLP – Diffraction Limited Probe
DLTS – Deep Level Transient Spectroscopy
DOF – Depth Of Focus
DP – Diffraction Pattern
DPN – Dip-Pen Nanolithography
DQE – Detector Quantum Efficiency
DREEM – Double Reflection Electron Emission Microscope
DSP – Digital Signal Processor
DSTEM – Dedicated Scanning Transmission Electron Microscopy
DTEM – Dynamic Transmission Electron Microscope

E

EB – Electron Beam
EBIC – Electron Beam Induced Current (Conductivity)
EBIV – Electron Beam Induced Voltage
EBL – Electron Beam Lithography
EBSD – Electron Back Scattered Diffraction
EBSP – Electron Back Scattering Patterns
ECP – Electron Channeling Pattern
ED – Electron Diffraction
EDP – Energy Dispersive Plane
EDS – Energy Dispersive Spectroscopy
EDX – Energy Dispersive X-ray analysis
EDXS – Energy Dispersive X-ray Spectroscopy
EEL – Electron Energy Loss
EELM – Electron Energy Loss Microscopy
EELS – Electron Energy Loss Spectroscopy
EFI – Energy Filtered Imaging
EFTEM – Energy Filtered Transmission Electron Microscopy
EH – Electron Holography
EHL – Electron Holographic Lithography
ELE – Electrons with Losses of Energy
ELNES – Energy Loss Near Edge Structures
EM – Electron Microscopy
EMFP – Elastic Mean Free Path
EP – Electron Plasmons
ESCA – Electron Spectroscopy for Chemical Analysis
ESD – Environmental Scanning electron Detector
ESEM – Extended Low Vacuum Mode
ESI – Electron Spectroscopic Imaging
ET – Everhart-Thornley
ETD – Everhart-Thornley Detector
EXAFS – Extended X-ray Absorption Fine Structure
EXELFS – Extended Energy Loss Fine Structures

F

FBD – Focused Probe Diffraction
FC-AFM – Force Clamp Atomic Force Microscopy
FCF – Fluorescence Correction Factor
FCS – Fluorescence Correlation Spectroscopy
FE-EPMA – Field Emission Electron Probe Microanalyzer
FEG – Field Emission Gun

FEP – Filter Entrance Plane
FESEM – Field Emission Scanning Electron Microscopy
FET – Field Effect Transistor
FFM – Friction Force Microscopy
FFP – Front Focal Plane
FFT – Fast Fourier Transform
FIB – Focused Ion Beam
FIM – Field Ion Microscopy
FIP – Final Image Plane
FM-AFM – Frequency Modulated Atomic Force Microscopy
FOLZ – First Order Laue Zone
FSE – Fast Secondary Electrons
FWHM – Full Width of Half Maximum
FWTM – Full Width at Tenth Maximum
FX-AFM – Force Extension Atomic Force Microscopy
FX-rays – Secondary X-ray Fluorescence

G

GB – Grain Boundary
GCS – Generalized Cross Section
GOS – Generalized Oscillator Strength
GSED – Gaseous Secondary Electron Detector

H

HAADF – High Angle Annular Dark Field detector
HFA – Hyperbolic Field Analyser
HFEG – Hot Field Emission Gun
HFE-STEM – Holography Field Emission Scanning Transmission Electron Microscope
HIEM – Holographic Interfernce Electron Microscopy
HOLZ – High Order Laue Zone
HPGe – High Purity Germanium crystal
HREELS – Highly spatially Resolved Electron Energy Spectroscopy
HREM – High Resolution Electron Microscopy
HRLVFESEM – High Resolution Low Voltage Field Emission Scanning Electron Microscopy
HRSEM – High Resolution Scanning Electron Microscopy
HRTEM – High Resolution Transmission Electron Microscopy
HV – High Vacuum
HVEM – High Voltage Electron Microscopy

I

IDB – Inversion Domain Boundary
IETS – Inelastic Electron Tunneling Spectroscopy
IG – Intrinsic Ge
IKL – Intersecting Kikuchi Line
ILDOS – Integrated Local Density Of State
IMFP – Inelastic Mean Free Path
IPES – Inverse Photoemission Spectroscopy
IRF – Impulse Response Function
IVEM – Intermediate Voltage Electron Microscope

K

KDI – Kirchhoff Diffraction Integral
KFM – Kelvin Force Microscopy
KPFM – Kelvin Probe Force Microscopy

L

LACBED – Large Angle Convergent Beam Electron Diffraction
LDOS – Local Density Of States
LEDS – Low Energy Diffuse Scattering
LEED – Low Energy Electron Diffraction
LEELM – Low Electron Energy Loss Microscopy
LEEM – Low Energy Electron Microscopy
LFM – Lateral Force Microscopy
LIMS – Laser Induced Mass Spectrometry
LP – Lattice Phonons

LPSO – Long Period Stacking Order
LSP – Localized Surface Plasmons
LT-STM – Low Temperature Scanning Tunneling Microscopy
LV – Low Vacuum
LV-SEM – Low Voltage Scanning Electron Microscope
LVEM – Low Voltage Electron Microscopy

M

MBI – Multibeam Imaging
MCA – Multichannel Analyzer
MCD – Magnetic Circular Dichroism
MDF – Modulation Transfer Function
MCP – Microchannel Plate
MD – Microdiffraction
MDFF – Mixed Dynamic Form Factor
MDM – Minimum Detectable Mass
MEM – Mirror Electron Microscopy
MFM – Magnetic Force Microscopy
MIEEM – Metastable Impact Electron Emission Microscopy
MLCFA – Maximum Likelihood Common Factor Analysis
MOKE – Magnetooptical Kerr Effect microscopy
MRFM – Magnetic Resonance Force Microscopy
MTF – Modulation Transfer Function
MULSAM – Multispectral Analytical (Auger) Microscope

N

NA – Numerical Aperture
NC-AFM – Noncontact Atomic Force Microscope
NEXAFS – Near Edge X-ray Absorption Fine Structure
NIR – Near Infrared
NPB – Nearly Parallel Beam

O

OIM – Orientation Imaging Microscopy
OTEDP – Oblique Textured Electron Diffraction Pattern
OTF – Optical Transfer Function

P

P/B – Peak to Background ratio
PB – Phase Boundary
PBI – Parallel Beam Illumination
PCD – Projected Charge Density
PCTF – Phase Contrast Transfer Function
PE – Primary Electrons
PEELS – Parallel Electron Energy Loss Spectroscopy
PEEM – Photoemission Electron Microscopy
PFM – Piezoelectric Force Microscopy
PHA – Pulse Height Analysis
PHEEM – Photoelectron Emission Microscope
PIXE – Photon Induced X-ray Emission
PM – Photomultiplier
PMT – Photomultiplier Tube
PPH – Point Projection Holography
PSD – Positionally Senesitive Detector
PSF – Point Spread Function

Q

QCBED – Quantitative Convergent Beam Electron Diffraction
QHRTEM – Quantitative High Resolution Transmission Electron Microscopy
QSEM – Quantitative Scanning Electron Microscopy

R

RCB – Rocking Beam Channeling Pattern
RDF – Radial Distribution Function
REELS – Reflection Electron Energy Loss Spectroscopy
REM – Reflection Electron Microscope
RFA – Retarding Field Analyser
RHEED – Reflection High Energy Electron Diffraction

S

S/N – Signal to Noise ratio
SA – Surface Analysis
SAD – Selected Area Diffraction
SADP – Selected Area Diffraction Pattern
SAED – Selected Area Electron Difraction
SAM – Scannning Auger Microscopy
SAXS – Small Angle X-ray Scattering
SC – Sample Current
SCALPEL – Scattering with Angular Limitation Projection Electron Lithography
SCM – Scanning Capacitance Microscopy
SDD – Silicon Drift Detector
SDLTS – Scanning Deep Level Transient Spectroscopy
SE – Secondary Electrons
SEAM – Scanning Electron Acoustic Microscopy
SEC – Schottky Emission Cathode
SEELS – Serial Electron Energy Loss Spectrometer (Spectroscopy)
SEEM – Secondary Electron Emission Microscopy
SEG – Side Entry Goniometer
SEM – Scanning Electron Microscopy
SEMPA – Scanning Electron Microscopy with Polarisation Analysis
SEN – Secondary Electron Noise
SERS – Surface Enhanced Raman Scattering
SF – Stacking Faults
SFA – Surface Forces Apparatus
SFXM – Scanning Fluorescence X-ray Microscope
SGM – Scanning Gate Microscopy
SH-PFM – Second Harmony Piezo Force Microscopy
SHRLI – Simulated High Resolution Lattice Images
SIM – Scanning Impedance Microscopy
SIMS – Secondary Ion Mass Spectrometry
SLEEM – Scanning Low Energy Electron Microscopy
SLM – Spatial Light Modulator
SLS – Strained Layer Superlattices
SMART – Scanning Microscope Analysis and Resolution Testing
SNOL – Scanning Near field Optical Lithography
SNOM – Scanning Near field Optical Microscopy
SNR – Signal to Noise Ratio
SOLZ – Second Order Laue Zone
SP-STM – Spin Polarized Scanning Tunneling Microscopy
SPAN – Scanning Probe Alloying Nanolithography
SPBN – Scanning Probe Based Nanolithography
SPEM – Scanning Photoemission Microscope
SPL – Scanning Probe Lithography
SPLEEM – Spin Polarized Low Energy Electron Microscopy
SPM – Scanning Probe Microscopy
SPS – Scanning Probe Spectroscopy
SREM – Scanning Reflection Electron Microscopy
SRM – Standard Reference Material
SSPM – Scanning Surface Potential Microscopy
STED – Stimulated Emission Depletion
STEM – Scanning Transmission Electron Microscopy
STXM – Scanning Transmission X-ray Microscope

T

TB – Twin Boundary
TCC – Transmission Cross Coefficient
TCNL – Thermochemical Nanolithography
TDS – Thermal Diffuse Scattring
TE – Transmitted Electrons
TEM – Transmission Electron Microscopy
TFE – Thermal Field Emitter
THEED – Transmission High Energy Electron Diffraction
TIR – Total Internal Reflection
TLEED – Transmission Low Energy Electron Diffraction

TM-AFM – Tapping Mode Atomic Force Microscopy
TOFA – Time Of Flight Analyser
TTL – Through The Lens detector
TXM – Transmission X-ray Microscope

U

UED – Ultrafast Electron Diffraction
UEM – Ultrafast Electron Microscopy
UHV – Ultrahigh Vacuum
UHV-SEM – Ultrahigh Vacuum Scanning Electron Microscope
UHV-STM – Ultrahigh Vacuum Scanning Tunneling Microscope
UTW – Ultrathin Window
UVPEEM – Ultraviolet Light Excited Photoemission Electron Microscopy

V

V/F – Voltage to Frequency converter
VLV-SEM – Very Low Voltage Scanning Electron Microscope
VP-SEM – Variable Pressure Scanning Electron Microscope
VPSE – Variably Pressure Secondary Electron detector

W

WAXS – Wide Angle X-ray Scattering
WB – Weak Beam
WBDF – Weak Beam Dark Field
WBEM – Weak Beam Electron Microscopy
WBI – Weak Beam Imaging
WD – Working Distance
WDX – Wavelenght Dispersive X-ray analysis

X

X-STM – Cross-sectional Scanning Tunneling Microscopy
XANES – X-ray Absorption Near Edge Structure
XCF – Cross Correlation Function
XEDS – X-ray Energy Dispersive Spectroscopy
XMCD – X-ray Magnetic Circular Dichroism
XMLD – X-ray Magnetic Linear Dichoism
XPEEM – X-ray Photoemission Electron Microscopy
XPS – X-ray Photoelectron Spectroscopy
XRD – X-ray Diffraction
XRF – X-ray Fluorescence
XRMA – X-ray Microanalysis
XSI – X-ray Spectrum Images

Z

ZAF – Atomic number, absorption, fluorescence correction
ZAP – Zone Axis Pattern
ZL peak – Zero Loss peak
ZOLZ – Zero Order Laue Zone

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