

# Contents

<i>Contributors</i>	<i>ix</i>
<i>Preface</i>	<i>xi</i>
<b>1. Intensity interferometry experiment: photon bunching in cathodoluminescence</b>	<b>1</b>
Sophie Meuret	
1. The Hanbury Brown and Twiss experiment applied to cathodoluminescence	1
2. Observation of the bunching effect	8
3. Monte Carlo model	14
4. Analytical model	25
5. Photon bunching in a scanning electron microscope	35
6. Conclusion	41
Acknowledgments	42
References	42
<b>2. Applications of photon bunching in cathodoluminescence</b>	<b>47</b>
Sophie Meuret	
1. Introduction	47
2. Lifetime measurement at the nanometer scale	48
3. Comparison with time-resolved $\mu$ -photoluminescence	64
4. Lifetime measurement on AlN defect	69
5. Measurement of the probability of excitation	75
6. Conclusion	82
Acknowledgments	83
References	83
<b>3. A quantum propagator for electrons in a round magnetic lens</b>	<b>89</b>
Stefan Löffler, Ann-Lenaig Hamon, Denis Aubry, Peter Schattschneider	
1. Introduction	89
2. Theory	91
3. Results	97
4. Conclusion	102
Acknowledgments	103
References	103

<b>4. Progress in determining of compound composition by BSE imaging in a SEM and the relevant detector disadvantages</b>	<b>107</b>
Valentin G. Dyukov, Sergej A. Nepijko	
1. Introduction	107
2. Composition analysis of the elongated flat specimens using <i>Z</i> -contrast of BSE imaging in a SEM	108
3. Stoichiometric analysis of individual microparticles	111
4. Special BSE detectors with improved efficiency for SEM	122
5. The detectors special features for accurate BSE output measurements in a SEM	127
6. Conclusions and outlook	137
Acknowledgments	139
References	139
<b>5. A new paradigm for FDM: cylindrically symmetric electrostatics</b>	<b>141</b>
David Edwards Jr	
Preface	141
1. The two methods of creating algorithms for FDM	142
2. New paradigm for FDM	149
Acknowledgments	173
Appendix A Algorithms order 2 and 4	174
References	179
<b>6. Solutions of the Laplace equation in cylindrical coordinates, driven to 2D harmonic potentials</b>	<b>181</b>
Igor F. Spivak-Lavrov, Telektes Zh. Shugaeva, Samat U. Sharipov	
1. Introduction	181
2. Quadrupole on the cylinder	182
3. Various analytical approaches	185
4. Calculation of the field of a multi-electrode cylindrical lens	186
5. Calculation of the transaxial lens field	188
6. Conclusion	192
Acknowledgments	192
References	193
<b>7. Characteristics of triode electron guns</b>	<b>195</b>
Rolf Lauer	
1. Introduction	195
2. Electron trajectories	197
3. Determination of the geometrical properties	205
4. Brightness	224
5. The energy distribution	246

Acknowledgments	264
References	265
<i>Index</i>	267