

# Contents

<b>Introduction</b>	<b>1</b>
<b>1 The Weyl calculus</b>	<b>13</b>
1.1 An introduction to the usual Weyl calculus . . . . .	13
1.2 Two composition formulas . . . . .	26
1.3 The totally radial Weyl calculus . . . . .	38
<b>2 The Radon transformation and applications</b>	<b>47</b>
2.1 The Radon transformation . . . . .	48
2.2 Back to the totally radial Weyl calculus . . . . .	58
2.3 The dual Radon transform of bihomogeneous distributions . . . . .	62
2.4 The symmetries $\nu \mapsto -\nu$ and $\rho \mapsto 2 - \rho$ . . . . .	73
<b>3 Automorphic functions and automorphic distributions</b>	<b>81</b>
3.1 Automorphic background . . . . .	82
3.2 Automorphic distributions . . . . .	92
3.3 The Kloosterman-related series $\zeta_k(s, t)$ . . . . .	99
3.4 About the sharp product of two Eisenstein distributions . . . . .	104
3.5 The pointwise product of two Eisenstein series . . . . .	108
3.6 The continuation of $\zeta_k$ . . . . .	114
<b>4 A class of Poincaré series</b>	<b>121</b>
4.1 An automorphic distribution of a Poincaré series type . . . . .	122
4.2 The automorphic function $f_{\rho, \nu}$ . . . . .	132
4.3 The analytic continuation of $f_{\rho, \nu}$ . . . . .	137
4.4 Asymptotics of $f_{\rho, \nu}(x + iy)$ , $y \rightarrow \infty$ . . . . .	145
4.5 The Roelcke-Selberg expansion of $f_{\rho, \nu}$ . . . . .	160
4.6 Incomplete $\rho$ -series . . . . .	171
4.7 The automorphic measures $ds_{\Sigma}^{(\rho)}$ ; related work . . . . .	174
4.8 A duality . . . . .	182

<b>5 Spectral decomposition of the Poincaré summation process</b>	<b>187</b>
5.1 A universal Poincaré series . . . . .	188
5.2 Spectral decomposition of the bilinear form $\mathfrak{P}$ . . . . .	205
5.3 Technicalities and complements . . . . .	222
<b>6 The totally radial Weyl calculus and arithmetic</b>	<b>233</b>
6.1 Radial functions and measures on $\mathbb{R}^n$ ; the soft calculus . . . . .	235
6.2 Totally radial operators and arithmetic measures . . . . .	242
<b>7 Should one generalize the Weyl calculus to an adelic setting ?</b>	<b>251</b>
7.1 Eisenstein distributions with zeros of zeta for parameters . . . . .	253
7.2 The automorphic distribution $N^{i\pi\varepsilon}\mathfrak{T}_N$ as a symbol . . . . .	264
7.3 Adeles and ideles . . . . .	270
7.4 Renormalizing the $p$ -adic Weyl calculus . . . . .	279
<b>Index</b>	<b>291</b>
Index of Notation . . . . .	291
Subject Index . . . . .	293
<b>Bibliography</b>	<b>295</b>



<http://www.springer.com/978-3-0348-0165-2>

Pseudodifferential Analysis, Automorphic Distributions  
in the Plane and Modular Forms

Unterberger, A.

2011, VIII, 300 p., Softcover

ISBN: 978-3-0348-0165-2

A product of Birkhäuser Basel