

# Contents

Acknowledgments and Permissions	v
Series Editor's Preface	vii
Contents by Author	xi
<b>Introduction</b>	<b>1</b>
<b>Comments on Multiplicity Theory—H. Cramér</b>	<b>7</b>
<b>Comments on the Theory of Multiplicity for Gaussian Processes—T. Hida</b>	<b>11</b>
<b>Editors' Comments on Paper 1</b>	<b>15</b>
1. Bode, H. W., and C. E. Shannon: "A Simplified Derivation of Linear Least Square Smoothing and Prediction Theory" <i>Proc. I.R.E.</i> , <b>38</b> , 417-425 (1950)	<b>16</b>
<b>Editors' Comments on Paper 2</b>	<b>25</b>
2. Hanner, Olof: "Deterministic and Non-deterministic Stationary Random Processes" <i>Ark. Mat.</i> , <b>1</b> , 161-177 (1950)	<b>26</b>
<b>Editors' Comments on Paper 3</b>	<b>43</b>
3. Lévy, P.: "Sur une classe de courbes de l'espace de Hilbert et sur une équation intégrale non-linéaire". <i>Ann. Sci. Ecole Normale Supérieure</i> , <b>73</b> , 121-156 (1956)	<b>44</b>
<b>Editors' Comments on Paper 4</b>	<b>80</b>
4. Belyaev, Y. K.: "Analytic Random Processes" <i>Theory Probability Appl.</i> , 402-409 (1959)	<b>81</b>
<b>Editors' Comments on Paper 5</b>	<b>89</b>
5. Cramér, Harald: "On Some Classes of Nonstationary Stochastic Processes" <i>Proc. Fourth Berkeley Symp. Stat. Appl. Probability</i> , <b>II</b> , 57-78 (1960)	<b>90</b>
<b>Editors' Comments on Paper 6</b>	<b>112</b>
6. Hida, Takeyuki: "Canonical Representations of Gaussian Processes and Their Applications" <i>Mem. College Sci., Univ. Kyoto</i> , <b>A33</b> (1), 109-155 (1960)	<b>113</b>
<b>Editors' Comments on Paper 7</b>	<b>161</b>
7. Cramér, Harald: "On the Structure of Purely Non-deterministic Stochastic Processes" <i>Ark. Mat.</i> , <b>4</b> , 249-266 (1961)	<b>162</b>
<b>Editors' Comments on Paper 8</b>	<b>180</b>
8. Kalman, R. E. and R. S. Bucy: "New Results in Linear Filtering and Prediction Theory" <i>Trans. ASME, Ser. D, J. Basic Eng.</i> , <b>83</b> , 95-107 (1961)	<b>181</b>

<b>Editors' Comments on Papers 9 and 10</b>	<b>195</b>
9. Kallianpur, G., and V. Mandrekar: "On the Connection between Multiplicity Theory and O. Hanner's Time Domain Analysis of Weakly Stationary Stochastic Processes"	<b>196</b>
<i>Univ. North Carolina Monograph Ser. Probability Stat.</i> , No. 3, 385–396 (1970)	
10. Kallianpur, G., and V. Mandrekar: "Multiplicity and Representation Theory of Purely Non-deterministic Stochastic Processes"	<b>208</b>
<i>Theory Probability Appl.</i> , <b>10</b> (4), 553–581 (1965)	
<b>Editors' Comments on Papers 11 and 12</b>	<b>237</b>
11. Cramér, Harald: "Stochastic Processes as Curves in Hilbert Space"	<b>238</b>
<i>Theory Probability Appl.</i> , <b>9</b> (2) 169–179 (1964)	
12. Cramér, Harald: "A Contribution to the Multiplicity Theory of Stochastic Processes"	<b>249</b>
<i>Proc. Fifth Berkeley Symp. Stat. Appl. Probability</i> , <b>II</b> , 215–221 (1965)	
<b>Editors' Comments on Papers 13 and 14</b>	<b>256</b>
13. Kailath, Thomas: "An Innovations Approach to Least-Squares Estimation. Part I: Linear Filtering in Additive White Noise"	<b>257</b>
<i>IEEE Trans. Automat. Control</i> , <b>AC-13</b> (6), 646–655 (1968)	
14. Kailath, Thomas, and Paul Frost: "An Innovations Approach to Least-Squares Estimation. Part II: Linear Smoothing in Additive White Noise"	<b>267</b>
<i>IEEE Trans. Automat. Control</i> , <b>AC-13</b> (6), 655–660 (1968)	
<b>Editors' Comments on Paper 15</b>	<b>273</b>
15. Mandrekar, V.: "On Multivariate Wide-Sense Markov Processes"	<b>274</b>
<i>Nagoya Math. J.</i> , <b>33</b> , 7–19 (1968)	
<b>Editors' Comments on Paper 16</b>	<b>287</b>
16. Kailath, Thomas: "The Innovations Approach to Detection and Estimation Theory"	<b>288</b>
<i>Proc. IEEE</i> , <b>58</b> (5), 680–695 (1970)	
<b>Editors' Comments on Paper 17</b>	<b>304</b>
17. Cramér, Harald: "Structural and Statistical Problems for a Class of Stochastic Processes"	<b>305</b>
The First Samuel Stanley Wilks Lecture at Princeton University, March 17, 1970, 1–30 (1971)	
<b>Editors' Comments on Papers 18 and 19</b>	<b>335</b>
18. Kadota, T. T. "Nonsingular Detection and Likelihood Ratio for Random Signals in White Gaussian Noise"	<b>336</b>
<i>IEEE Trans. Inform. Theory</i> , <b>IT-16</b> (3), 291–298 (1970)	
19. Shepp, L. A.: "Radon–Nikodym Derivatives of Gaussian Measures"	<b>344</b>
<i>Ann. Math. Stat.</i> <b>37</b> (2), 321–354 (1966)	
<b>Editors' Comments on Paper 20</b>	<b>379</b>
20. Ivkovich, Z., and Yu. A. Rozanov: "On the Canonical Hida–Cramér Representation for Random Processes"	<b>380</b>
<i>Theory Probability Appl.</i> , <b>16</b> (2), 351–356 (1971)	
Author Citation Index	<b>387</b>
Subject Index	<b>391</b>