

EXTRACT FROM OP-SF NET

Topic #10 ----- OP-SF NET 19.1 ----- January 15, 2012

From: OP-SF NET Editors

Subject: New book on Asymptotics

Hadamard Expansions and Hyperasymptotic Evaluation: An Extension of the Method of Steepest Descents

by R. B. Paris

Cambridge University Press

Series: Encyclopedia of Mathematics and its Applications (No. 141)

- Hardback
- ISBN:9781107002586
- Publication date: March 2011
- 252 pages
- 70 b/w illus. 30 tables
- £50.00

From the publisher's web site:

The author describes the recently developed theory of Hadamard expansions applied to the high-precision (hyperasymptotic) evaluation of Laplace and Laplace-type integrals. This brand new method builds on the well-known asymptotic method of steepest descents, of which the opening chapter gives a detailed account illustrated by a series of examples of increasing complexity. A discussion of uniformity problems associated with various coalescence phenomena, the Stokes phenomenon and hyperasymptotics of Laplace-type integrals follows. The remaining chapters deal with the Hadamard expansion of Laplace integrals, with and without saddle points. Problems of different types of saddle coalescence are also discussed. The text is illustrated with many numerical examples, which help the reader to understand the level of accuracy achievable. The author also considers applications to some important special functions. This book is ideal for graduate students and researchers working in asymptotics.