Preface

The b-physics results from the LEP data sets exceeded all expectations in both the range of topics covered and the precision of measurements that were eventually possible. The success was due to several factors such as the rapid development of silicon-strip vertex detectors, advances in the theoretical description of b-hadrons and not least because of the inventiveness, skill and determination of the experimenters performing the data analysis. In order to utilise fully the precision of the new vertex detectors, careful commissioning and event reconstruction was needed. This together with new methods and techniques of data analysis, particularly in the area of inclusive b-hadron reconstruction, were the key to a whole host of measurements that spanned the entire field of b-physics.

The aim of this book is not to give another review of b-physics results. Instead the focus is on reviewing the main experimental methods that evolved (hardware and software) and the lessons learnt from somebody who was involved first-hand in their development and use. The hope is that this work will both stand as a record of what was achieved with the LEP data, and also as a reference source of b-physics analysis ideas for experimenters embarking on projects in the future e.g. at the LHC or a linear collider.

Results from all four of the LEP experiments are reported but some bias towards DELPHI is inevitable, especially to illustrate general points, since I am a collaboration member and have easier access to material. I wish to thank my friends and colleagues of the DELPHI collaboration for making the project such a success.

In addition I wish to give special thanks to: Prof. Dr. Michael Feindt who was the instigator of inclusive analysis methods for b-physics with the LEP data; Prof. Dr Thomas Müller for giving me the opportunity and encouragement to write this article; Dr. Richard Hawkings (OPAL) and Dr. Christian Weiser (DELPHI) for allowing me access to some unpublished results and for useful discussions. Finally I would like to thank the people at Springer, especially Ute Heuser for her professional handling of the project and patience with my regular failure to meet deadlines.

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