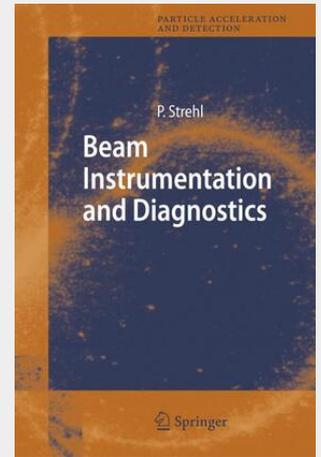


Strehl

Beam Instrumentation and Diagnostics

This book summarizes the experience of many years of teamwork with my group, the beam diagnostics group of GSI. For a long time the group was also responsible for operating the machines and application programming. In my opinion, this connection was very efficient: first, because a beam diagnostic system has to place powerful tools at the operators' disposal; second, because data evaluation and presentation of results for machine operation demand application programs which can be handled not only by skilled experts. On the other hand, accelerator developments and improvements as well as commissioning of new machines by specialists require more complex measurements than those for routine machine operation. A modern beam diagnostic system, including the software tools, has to cover these demands, too. Therefore, this book should motivate physicists, constructors, electronic engineers, and computer experts to work together during the design and daily use of a beam diagnostic system. This book aims to give them ideas and tools for their work. I would not have been able to write this book without a good education in physics and many discussions with competent leaders, mentors, and colleagues. After working about 40 years in teams on accelerators, there are so many people I have to thank that it is impossible to mention them all by name here.

This treatise covers all aspects of the design and the daily operations of a beam diagnostic system for a large particle accelerator. A very interdisciplinary field, it involves contributions from physicists, electrical and mechanical engineers and computer experts alike so as to satisfy the ever-increasing demands for beam parameter variability for a vast range of operation modes and particles. The author draws upon 40 years of research and work, most of them spent as the head of the beam diagnostics group at GSI. He has illustrated the more theoretical aspects with many real-life examples that will provide beam instrumentation designers with ideas and tools for their work.



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