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Milorad Mladjenović

Development of Magnetic β-Ray Spectroscopy

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To
Nobel Institute for Physics
Birthplace of Modern Beta-Ray Spectroscopy

FOREWORD

Although beta-ray spectroscopy is about 65 years old, there is no monograph, or any other kind of a book entirely devoted to a complete exposition of design and construction of beta-ray spectrometers. Development has been covered periodically only by review articles in books and journals. The situation is completely opposite from the one in the neighbouring field of electron microscopy, which abounds in all kinds of monographs and handbooks. That is the main reason why I have tried to include as many as possible different types of spectrometers which were developed in the past, although quite a few of them might not be used now for the measurement of beta spectra. No spectroscopy has ever died. It may be neglected in one field to start a new life in another. They are often born in physics, pass to chemistry and migrate to many applied fields, from metallurgy to archeology. Since some of those new uses might not need the sophisticated devices developed in nuclear physics, a rather complete coverage of various types can help to find the optimum design for a given case.

This book was developed gradually through post-graduate courses given in Belgrade, Rome, Cairo and Nashville. I am grateful to Prof. S. Sciuti, M. El-Nadi and J. H. Hamilton for the hospitality and the chance given to write up some lectures which are parts of this book.

My initiation in this field started in 1948, when Dr. R. J. Walen, the head of the Physics laboratory gave me the subject for my diploma work: "Le calcul des trajectoires des électrons dans une lentille magnétique." His tireless guidance prepared me for the next phase, which was the work in the Nobel Institute for Physics, Stockholm. It was a bit of luck to come to Stockholm just at the time when they had completed the first large double-focusing spectrometer and the whole field was in the initial stages of the well-known boom. I cannot forget the spirit and people I met there, and I remain forever grateful to Profs. Manne Siegbahn, Kai Siegbahn, Hilding Slätis, Arne Hedgran and Ingmar Bergström.

Once back in Belgrade, I was given the chance by my professor, Pavle Savić, founder of "B. Kidrič" Institute, to build several spectrometers. I am grateful to him for bringing me to this Institute and giving me all the opportunities that a young man could wish.

My thanks are due to Mr. Nikola Skorupan, who not only helped me constructing the spectrometers, but also made the drawings for this book.

Belgrade, December 1974 Milorad Mladjenović

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