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History of mass measurements with time-of-flight mass analyzers

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Since about 100 years mass spectrometry has been a most useful tool for basic science and nuclear physics and very importantly for the analysis of molecules. Starting from laterally dispersive sector field mass spectrometers the different methods of time-of-flight mass analyses are described regarding their basic principles and limitations. The main applications discussed will be those for the mass determination for short-lived nuclei and their importance for the formation of heavy elements in supernova star implosions. This will include the description of mass measurements of highly charged high energy ions in heavy ion accelerator storage rings as energy isochronous systems or systems in which the ions have been cooled to be substantially mono-energetic. The use of modern multi-pass time-of-flight mass analyzers will also be discussed for the analysis of molecules as well as for the analysis of atoms and molecules in space-missions like ROSETTA.

Biography

Hermann Wollnik has completed his PhD at the age of 28 years from the Technical University of Munich in Germany. He has been a professor and director of a research team focusing on the mass analysis of short-lived nuclei at the University Giessen, Germany and the GSI heavy ion accelerator in Darmstadt Germany. He also worked the Osaka University and the RIKEN research center in Japan as well as in the Los Alamos and Oak Ridge National Laboratories in the USA. After retiring from the University in Giessen, he is a professor at the New Mexico State University in Las Cruces, USA where he deals mainly with mobility analyzers and their connection to mass spectrometers. He has published more than 250 papers in reputed journals and served as an editorial board member of the international Journal of Mass Spectrometry.

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