

The theory of diffraction. SHF electronics by L A Weinstein

The theory of diffraction. SHF electronics (Collected works)
L A Weinstein (Moscow: Radio i svyaz', 1955) 600 pp

It is only on formal grounds that this book can be regarded as an academic publication intended to collect major works of an outstanding scientist with a view to comprehensively represent his research activities. The Editorial Body headed by S M Rytov succeeded in selecting around a quarter of all the materials published by L A Weinstein over 40 years to produce a book on current problems of the theory of diffraction and SHF electronics. Introductory notes and reminiscences by L A Weinstein's colleagues included in the book provide a brief outline of his unique creative personality which well help readers to understand why his results and ideas are still considered to be of great value. L A Weinstein's approach to problems was always faultlessly logical and based on exhaustive analysis. A deeper insight into the works of L A Weinstein allows the reader not only to learn about electron motion or propagation of an electromagnetic wave but also to trace back the train of the author's thought that brought him to the solution of the problem.

L A Weinstein used to think out the problem he was about to discuss. In his papers, he never tried to outrun the reader but at the same time took enough care not to deter him. This betrays a good lecturer (L A Weinstein is said to have been conspicuous in this capacity), but a lecturer can immediately respond to his audience, whereas a writer has to divine the reaction of the reader. L A Weinstein wielded a skilful pen, and his texts impress everyone as an even flow of arguments and reasoning.

The book contains two sections the headings of which, taken together, make up the title of the publication. The main topics covered in the first section are semi-infinite waveguides, open resonators, dense lattices, and parabolic equations. Section 2 deals with non-relativistic and relativistic electronic instruments, the interaction between electron fluxes and resonant systems, etc.

One of the three papers first published after the author's death is devoted to "Field and electronic vibrations and waves in superhigh frequency vacuum electronics". The paper presents a survey of interactions between electronic and electromagnetic vibrations and "...elucidates the conditions under which electronic vibrations play a major role and grow in a time-dependent manner due to their connection with vibrations of the resonator". The author shows that "...the competition between field and electronic vibrations prevails for those with the longest lifetime, i.e. the largest

characteristic time: quenching time for the field... and flight time for electrons..." In fact, this inference illustrates a typical approach to interpreting results of mathematical analysis by L A Weinstein.

The book being reviewed is one of a few scientific publications of this type that have appeared in this country during the last years. Moreover, it is a quality polygraphic product for its remarkably low price. Hopefully it will relaunch the process of scientific publication in Russia

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