V. N. Karazin Kharkiv National University

Modern physics

V. M. KUKLIN

SELECTED CHAPTERS
(THEORETICAL PHYSICS)

Kharkiv – 2021

PACS 52.35 Mw;41.60.-m;
05.45 Xt;03.65 Sq;47.55 pb
K 89

Reviewers:

V. A. Buts – Head of the laboratory of NSC KIPT, Professor of V. N. Karazin Kharkiv National University, PhD, Doctor of Sciences;

A. V. Tur – Directeur de recherche Emérite CNRS Université Paul Sabatier, Toulouse, France, PhD, Doctor of Sciences.

Approved for publication by the decision of the Academic Council
of V. N. Karazin Kharkiv National University
(Rec. No. 3 dated February 22.2021)

Kuklin V. M.

K 85 Selected chapters (theoretical physics) / V. M. Kuklin. – Kharkiv : V. N. Karazin Kharkiv National University, 2021. – 244 p. – (Series "Modern physics").

ISBN 978-966-285-700-9

The book considers spontaneous and induced emission of particles and waves. The formation of coherent pulses near a detected new threshold of induced radiation is discussed. It is shown how modulation instabilities generate self-similar structures and anomalous waves. A comparison is made of the dynamics of instability of Langmuir oscillations in plasma and heating of ions in Silin and Zakharov models. Turbulent-wave instability is discussed and a new approach to the description of the Mossbauer effect is presented. The similarity of processes of superradiation and dissipative instability is noted. Structural transitions in the convective layer and the appearance of large-scale vortices during modulation instability of developed convection and other relevant problems are discussed. It is of interest to specialists, graduate students and students of physics departments.

PACS 52.35 Mw;41.60.-m;
05.45 Xt;03.65 Sq;47.55 pb

ISBN 978-966-285-700-9

CONTENTS