

Included Content

Linac Operation Theory Textbook

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- Introduction
- Direct acceleration
- Series adding of electron energy
- Waveguides
- Phase velocity and guide wavelength
- Wave Impedance
- Acceleration timing
- Real accelerator structures
- Standing wave and travelling wave accelerating waveguides
- Energy Switch
- Summary
- Accelerator Waveguide Quiz

Chapter 2: Electron Beams

- Electron Path Through the Medical Linac
- Gun Emission
- Electron energy gain
- Bending Magnet
- Summary
- Electron Beam Quiz

Chapter 3: Photon Beams

- Classical Theory of Bremsstrahlung
- Quantum mechanical theory of Bremsstrahlung
- Energy dependence of angular photon distribution
- Thin and thick targets
- Thick target spectrum
- Beam quality specification
- Bremsstrahlung directional dependence
- Bremsstrahlung production efficiency
- Bremsstrahlung in SIMAC
- Results of bremsstrahlung calculations in SIMAC
- Beam flattening
- Energy dependence of beam flattening and beam flatness
- Beam symmetry

Chapter 4: Medical Linac Configuration

- Medical Linac Configurations
- Treatment Head Configuration
- Linac Mode Configuration

Chapter 5: Beam Steering

- Beam Symmetry
- The Elekta beam steering system

Chapter 6: Beam Dosimetry & PRF

- Ion Chambers in Medical Linacs*
- Ion chamber current collection*
- Linac Calibration*
- Dose Rate Control*
- Dose rate servo*

Chapter 7: Klystrons

- Microwave power sources for medical linear accelerators*
- Klystron overview*
- Description of the klystron's mode of operation*
- Bunching process*
- Klystron saturation*
- Klystron Modelling*
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Chapter 8: Magnetrons

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- Magnetron anode and RF*
- Resonant modes*
- Mode separation*
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- Bunch formation in rotational motion*
- Output coupler and frequency tuning*
- Magnetron operating values*

Chapter 9: Modulators

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- PFN Discharge*
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Chapter 10: Waveforms

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- Pulsed nature of the linear accelerator*
- Relationship between gun injection, reflected RF power, and beam output*

Linac Practical Servicing Textbook

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- Thermionic Diode*
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- Real Accelerator Structures*
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Chapter 8: Collimator

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- The Multi-Leaf Collimator (MLC)

Chapter 9: Klystron

- Microwave Power Sources for Medical Linear Accelerators
- Klystron Overview
- Description of the Klystron's Mode of Operation
- Bunching Process
- Klystron Saturation
- Magnetic Focusing
- Klystron Construction

Chapter 10: Magnetron

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Physics Quality Assurance Textbook

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