Contents

Preface vii
Introduction ix

Chapter 1. Production of high-power ion beams in reflecting systems

1. Two-component fluxes in diode systems 1
2. Theory of high-power ion–beam production in reflex systems 4
3. High-power ion–beam diagnostics methods 17
4. Experimental investigation of the reflecting systems 30

Chapter 2. High-power ion–beam generation in systems with magnetic confinement of the electron fluxes

1. Theory of high-power ion–beam generation in magnetically insulated diodes (MID) 41
2. Experimental investigations of magnetically insulated diodes 55
3. Theory of the generation of high-power ion beams in diodes with pinched electron flux (pinch diodes) 65
4. Experimental investigation of high-power ion–beam production in pinch diodes 74

Chapter 3. Transport and focusing of high-power ion beams

1. Neutralization and transport of high-power ion beams 89
2. Electromagnetic focusing of high-power ion beams 104
3. Ballistic focusing of high-power ion beams 114

Chapter 4. Application of high-power ion beams

1. Controlled thermonuclear fusion initiated by high-power ion beams 125
2. Ion rings for steady-state CTF 137
3. Gas lasers and neutron sources based on high-power ion beams 147
4. Conclusion 157

References 159