

CONTENTS

Foreword	1
CHAPTER 1— <i>Energetic Particle Injection</i>	
Results of Zarnitza-2, A Rocket Experiment on Artificial Electron Beam Injection in the Ionosphere	5
<i>V. S. Dokukin, V. N. Ivchenko, A. K. Markeev, G. P. Milinevsky, E. V. Mishin, R. I. Moysya, Ju. Ja. Ruzhin, R. Z. Sagdeev, V. V. Fomichev and I. A. Zhulin</i>	
Probing the Magnetosphere with Artificial Electron Beams	17
<i>J. R. Winckler</i>	
Artificial Plasma Jet in the Ionosphere	29
<i>G. Haerendel and R. Z. Sagdeev</i>	
Beam-Plasma Discharge in Near Rocket Region	47
<i>E. V. Mishin and Ju. Ja. Ruzhin</i>	
Rocket Borne Electron Accelerator Results Pertaining to the Beam Plasma Discharge	61
<i>P. J. Kellogg and S. J. Monson</i>	
Rocket Potential Measurements During Electron Beam Injection into the Ionosphere	69
<i>K. I. Gringauz, E. V. Mishin, N. M. Shutte and A. S. Volokitin</i>	
Peculiarities of the Environment Disturbance During the Electron Beam Injection from the Rocket	77
<i>R. Z. Sagdeev, G. G. Managadze, A. D. Mayorov, S. B. Lyakhov, A. A. Martinson, Yu. A. Romanovsky, T. G. Adeishvily, N. A. Leonov and T. I. Gagaa</i>	
The Waves Observed in the Araks-North Experiment	89
<i>M. Dechambre, J. Lavergnat, I. A. Zhulin, Yu. V. Kushnerevsky, S. A. Pulinets and V. V. Selegei</i>	
The Waves Observed in the Araks-East Experiment	97
<i>Yu. V. Kushnerevsky and S. A. Pulinets</i>	
Xe ⁺ -Induced Ion-Cyclotron Harmonic Waves	103
<i>D. Jones</i>	
Ion Beam Produced Plasma Waves Observed by the $\delta n/n$ Plasma Wave Receiver During the Porcupine Experiment	107
<i>P. M. Kintner and M. C. Kelley</i>	
Very Low Frequency Waves Stimulated by an Electron Accelerator in the Auroral Ionosphere	117
<i>J. A. Holtet, B. Grandal, T. A. Jacobsen, B. N. Maehlum, T. Trøim, B. K. Pran and A. Egeland</i>	

Ionospheric Electron Heating by a Rocket Borne Electron Accelerator <i>T. A. Jacobsen, J. Trøim, B. N. Maehlum and M. Friedrich</i>	123
Experiments with Injection of Powerful Plasma Jet into the Ionosphere <i>R. Z. Sagdeev, G. G. Managadze, A. A. Martinson, Yu. A. Romanovsky, R. I. Moysya, W. K. Riedler, M. F. Friedrich, T. G. Adeishvily, S. B. Lyakhov, L. S. Novikov, N. A. Leonov, T. I. Gagaa and I. I. Slyusarenko</i>	129
Energetic Electron Fluxes Stimulated with Pulsed Injection of Plasma in the Ionosphere <i>V. A. Alexandrov, A. P. Babaev, V. Y. Gaydukov, A. S. Loevsky, G. A. Popov and Y. A. Romanovsky</i>	141
Structure of Plasma Blobs Injected into the Ionosphere from a Rocket <i>V. A. Alexandrov, A. S. Loevsky, G. A. Popov, Y. A. Romanovsky and A. G. Sobol</i>	147
The Study of a Plasma Jet Injected by an On Board Plasma Thruster <i>I. A. Grebnev, G. V. Ivanov, V. P. Khodnenko, A. I. Morozov, I. A. Perkov, A. A. Pertsev, Ju. A. Romanovsky, Ju. P. Rylov, G. G. Shishkin and Ju. V. Trifonov</i>	153
Electron Beam Experiments in Japanese Satellites and Rockets <i>N. Kawashima, S. Sasaki, A. Ushikoshi, Y. Yagi, Y. Obayashi and O. Kaneko</i>	159
Fine Structure of Artificial Auroral Rays <i>E. V. Mishin, V. N. Ivchenko and G. P. Milinevskii</i>	163
Symmetric Model of Spacecraft Charging and Plasma Emission Effects <i>H. Maassberg and U. Isensee</i>	167
CHAPTER 2— <i>Plasma Wave Injection</i>	
Non-Linear Magnetospheric Amplification of VLF Transmissions <i>R. L. Dowden</i>	173
Plasma Resonance Stimulation in Space Plasmas <i>J. Etcheto, H. de Feraudy and J. G. Trotignon</i>	183
Jikiken (EXOS-B) Observation of Siple Transmissions <i>I. Kimura, H. Matsumoto, T. Makai, K. Hashimoto, R. A. Helliwell, T. F. Bell, U. S. Inan and J. P. Katsufakis</i>	197
ISEE-1 Observations in the Magnetosphere of VLF Emissions Triggered by Nonducted Coherent VLF Waves during VLF Wave-Injection Experiments <i>T. F. Bell and U. S. Inan</i>	203
Siple VLF Transmissions and their Magnetospheric Effects Observed at Halley, Antarctica <i>J. P. Matthews and K. H. Yearby</i>	209
VLF Transmissions from Kajford (Norway) to Scatha <i>M. Garnier, G. Girolami, H. Koons and M. Dazey</i>	213
Stimulation of Plasma Waves in the Magnetosphere Using Satellite Jikiken (EXOS-B) <i>H. Oya and T. Ono</i>	217

VLF Wave Generation by Modulated RF Heating of the Electrojet Ionosphere <i>R. L. Dowden, P. Stubbe and H. Kopka</i>	221
Active Stimulation of the Ionospheric Plasma <i>A. Y. Wong, J. Santoru, J. G. Roederer and G. Sivjee</i>	225
Nonlinear Effects of Injection of Very Low Frequency Waves into the Magnetosphere <i>O. A. Molchanov, M. M. Mogilevsky and Ju. A. Kopytenko</i>	229
A VLF Transmitter on the Space Shuttle <i>U. S. Inan, T. F. Bell, R. A. Helliwell and J. P. Katsuftrakis</i>	235
High-Frequency Radio Experiments with the Wisp System on Spacelab <i>H. G. James</i>	241
Digital Spacecraft Ionosondes <i>K. Bibl</i>	245
 CHAPTER 3— <i>Mass Injections</i>	
Large Scientific Releases <i>M. B. Pongratz</i>	253
The Effect of Rocket Launches on the Ionosphere <i>M. Mendillo</i>	275
Theoretical Aspects of Heavy Ion Injections in the Magnetosphere: A Review <i>Y. T. Chiu</i>	291
Active Ion Tracer Experiments Attempted in Conjunction with the Ion Composition Experiment on GEOS-2 <i>D. T. Young</i>	305
Artificial Particle and Wave Stimulation in the Trigger Experiment <i>G. Holmgren, P. M. Kintner and M. C. Kelley</i>	311
Measurements of the Artificially Stimulated Precipitation of Electrons from the Inner Radiation Belt in the Experiment “SPOLOKH-2” <i>I. A. Zhulin, Ju. M. Zhuchenko, V. M. Kostin, I. A. Pimenov, Ju. A. Romanovsky, Ju. Ja. Ruzhin and V. S. Skomarovsky</i>	319
A High-Altitude Barium Radial Injection Experiment <i>E. M. Wescott, H. C. Stenbaek-Nielsen, T. J. Hallinan, C. S. Deehr, J. V. Olson, J. G. Roederer and R. D. Sydora</i>	325
 CHAPTER 4— <i>Laboratory and Computer Simulations</i>	
Plasma Waves in the Laboratory <i>R. W. Boswell</i>	331
Laboratory Simulation of the Injection of Energetic Electrom Beams into the Ionosphere—Ignition of the Beam Plasma Discharge <i>W. Bernstein and P. J. Kellogg</i>	347
Bodies in Flowing Plasmas: Laboratory Studies <i>N. H. Stone and U. Samir</i>	361

Bodies in Flowing Plasmas: Spacecraft Measurements <i>U. Samir</i>	373
Laboratory Experiments and Space Phenomena <i>I. Podgorny</i>	385
Interaction Between a Body and its Environment During a Cometary Fly-By <i>R. J. L. Gard, L. W. Parker and D. T. Young</i>	403
A Numerical Model to Calculate the Wake Structure of a Spacecraft under Ionospheric Conditions <i>U. Isensee, W. Lehr and H. Maassberg</i>	409
Particle-In-Cell Simulation of the Plasma Environment of a Spacecraft in the Solar Wind <i>U. Isensee and H. Maassberg</i>	413
Laboratory Experiments on Spacecraft Charging and its Neutralization <i>S. Sasaki, N. Kawashima, A. Yamori, T. Obayashi and O. Kaneko</i>	417
CHAPTER 5—<i>Effects of Man on the Magnetosphere and Ionosphere</i>	
Power Line Radiation in the Magnetosphere <i>C. G. Park and R. A. Helliwell</i>	423
A Skeptic's View of PLR Effects in the Magnetosphere <i>B. T. Tsurutani and R. M. Thorne</i>	439
VLF Line Radiation Observed at Halley and Siple <i>K. H. Yearby, J. P. Matthews and A. J. Smith</i>	445
ELF Radio Signals Produced in the Auroral Ionosphere by Non-linear Demodulation of Signals from High-Power Amplitude-Modulated Transmitters <i>M. J. Rycroft, P. S. Cannon and T. Turunen</i>	449
Effects of Man on Geomagnetic Activity and Pulsations <i>A. C. Fraser-Smith</i>	455
Author Index	467

