

INTRODUCTION TO SUPERGRAVITY

CONTENTS

General Motivations

1. Lorentz and Poincare Groups
 - 1.1. Basic definitions.
 - 1.2. Two-component spinors.
 - 1.3. Four-component spinors.
2. Notion of irreducible representations of the Poincare Group.
 - 2.1. Poincare algebra.
 - 2.2. Brief survey of the irreducible representations of the Poincare group.
 - 2.3. Rartita-Schwinger equation.
3. Tetrad Formulation of Gravity.
 - 3.1. Tetrad covariant derivative.
 - 3.2. Covariant derivative of spinor.
 - 3.3. Gauge treatment of gravity.
4. Gauge Approach to Supergravity.
 - 4.1. Supersymmetry algebra.
 - 4.2. Representations of N=1 superalgebra.
 - 4.3. Superalgebra in terms of four-component spinors.
 - 4.4. Construction of the N=1, D=4 supergravity model.

LITERATURE

1. P. van Nieuwenhuizen, Supergravity, Physics Reports, **68**, No 4, 189-398, 1981.
2. J. Wess, J. Bagger, Supersymmetry and Supergravity, 1983.
3. S.J. Gates, M.T. Grisaru, M. Roćek, W. Siegel, Superspace or One Thousand and One Lessons in Supersymmetry, 1983; arXiv:hep-th/0108200.
4. P. West, Introduction to Supersymmetry and Supergravity, 1986, 1990.
5. I.L. Buchbinder, S.M. Kuzenko, Ideas and Methods of Supersymmetry and Supergravity or a Walk Through Superspace, 1995, 1998.
6. T. Ortin, Gravity and Strings, 2004.
7. D.Z. Freedman, A. Van Proeyen, Supergravity, 2011.
8. Y. Tani, Introduction to Supergravity, 2014.