Thesis

Contents

1 Nuclear structure **5**
1.1 Nuclear phenomenology 5
1.2 NN interaction 5
1.3 Nuclear mean field 5
1.4 Hartree-Fock and Nuclear DFT 5
1.5 Occupation number representation 5
1.6 Formal theory 5
1.7 Hartree-Fock method 5

2 Numerical methods **7**
2.1 Finite differences 7
2.2 General Conjugate Gradient 7

3 Skyrme functional and minimization **9**
3.1 Energy density 9
3.2 9

4 Results **11**
4.1 Results for spherical nuclei 11
4.2 Results for deformed nuclei 11

Chapter 1

Nuclear structure

1.1 Nuclear phenomenology

1.2 NN interaction

1.3 Nuclear mean field

1.4 Hartree-Fock and Nuclear DFT

1.5 Occupation number representation

1.6 Formal theory

1.7 Hartree-Fock method

Chapter 2

Numerical methods

2.1 Finite differences

2.2 General Conjugate Gradient

Chapter 3

Skyrme functional and minimization

3.1 Energy density

3.2

Chapter 4

Results

4.1 Results for spherical nuclei

4.2 Results for deformed nuclei