

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
2	Numerical methods	7
2.1	Finite differences	7
2.2	Conjugate Gradient	7
2.3	General conjugate gradient	7
3	Skyrme functional and minimization	9
3.1	Skyrme functional	9
3.2	Constraints	9
3.3	Coulomb field	9
3.4	Minimization	9
4	Results	11
4.1	Benchmark against spherical nuclei	11
4.2	Stability	11
4.3	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

Chapter 2

Numerical methods

2.1 Finite differences

2.2 Conjugate Gradient

2.3 General conjugate gradient

Chapter 3

Skyrme functional and minimization

3.1 Skyrme functional

3.2 Constraints

3.3 Coulomb field

3.4 Minimization

Chapter 4

Results

4.1 Benchmark against spherical nuclei

4.2 Stability

4.3 Results for deformed nuclei