

Contents

Summary	5
Introduction	7
1. Experimental Methods	11
1.1 The fusion evaporation reaction	11
1.2 The Recoil Distance Doppler Shift Method (RDDS)	12
1.2.1 The Differential Decay Curve Method	14
1.3 The Doppler-Shift Attenuation Method (DSAM)	16
1.3.1 The Narrow Gate on Transition Bellow Method (NGTB)	18
1.4 The GASP array	20
2. Two Nuclear Models	23
2.1 The nuclear shell model	23
2.1.1 Electromagnetic Transitions	27
2.2 The Interacting Boson Fermion plus Broken Pair Model (IBFBPM)	30
2.2.1 The IBM-1	30
2.2.2 The Interacting Boson Fermion Model (IBFM)	32
2.2.3 IBFM- plus broken pair (IBFM/BP)	32
3. Lifetime measurements in ^{95}Ru	35
3.1 Experiment and Analysis	35
3.1.1 The RDDS Experiment	35
3.1.2 Data analysis	36
3.2 Results	39
3.2.1 The Level Scheme	39

3.2.2	Results of the DDCM Analysis	43
3.2.3	The standard RDDS Analysis	46
3.3	Discussion	49
3.3.1	Experimental Transition Strengths	49
3.3.2	Interpretation in the frame of the Shell-Model	50
3.4	Conclusions	55
4.	Lifetimes measurements in ^{101}Ag	63
4.1	Experiments	63
4.1.1	The RDDS experiment	63
4.1.2	The DSA Experiment	64
4.2	Results	65
4.2.1	The DDCM analysis	65
4.2.2	The conventional RDDS method	70
4.2.3	The DSA and NGTB analyses	70
4.3	Discussion	74
4.3.1	Experimental Transition Strengths	74
4.3.2	Interpretation within the Interacting Boson-Fermion plus Broken Pair Model	74
4.4	Conclusions	80
	Bibliography	85
	Acknowledgments	93