

Contents

Abstract	vii
Zusammenfassung	ix
Acknowledgments	xi
Contents	xix
Acronyms	xxi
List of Figures	xxiii
List of Tables	xxv
List of Publications	xxvii
Further Publications	xxix
1 Introduction and Preliminaries	1
1.1 Motivation	1
1.2 State of the Art	1
1.2.1 Wiretap Channels	2
1.2.2 Arbitrarily Varying Channels	10
1.2.3 Arbitrarily Varying Wiretap Channels	16
1.3 Models	19
1.3.1 Wiretap Channels	19
1.3.2 Compound Channels	25
1.3.3 Discrete Memoryless Channels with Random States	29
1.3.4 Arbitrarily Varying Channels	35
1.3.5 Compound Wiretap Channels	47
1.3.6 Wiretap Channels with Random States and Non-Causal Side Information at the Encoder	54
1.3.7 Arbitrarily Varying Wiretap Channels	56
1.4 Contributions	67
2 Main Results	71
2.1 Arbitrarily Varying Wiretap Channels with Non-Causal Side Information at the Jammer	71
2.1.1 System Model	71
2.1.2 Main Results	77
2.1.3 Capacity Formulas without Side Information at the Jammer, or where the Jammer only knows the Messages	78

2.1.4	Discussion	78
2.2	Arbitrarily Varying Wiretap Channels with Constraints	83
2.2.1	System Model	83
2.2.2	Lower Bound on the CR-Assisted Secrecy Capacity for the Arbitrarily Varying Wiretap Channel with Constraints	86
2.2.3	Discussion	87
3	Conclusion and Future Work	89
3.1	Conclusion	89
3.2	Future Work	90
3.2.1	Arbitrarily Varying Wiretap Channels with Non-Causal Knowledge of the Channel Input at the Jammer	90
3.2.2	Arbitrarily Varying Wiretap Channels with Constraints	93
3.2.3	Other Directions	94
	Bibliography	95
A	Notation	109
B	Basic Results	117
B.1	Concentration Inequalities	117
B.2	Typical Sets and Sequences	118
B.3	Basic Arbitrarily Varying Channel / Arbitrarily Varying Wiretap Channel Results	119
C	Technical Proofs	121
C.1	Arbitrarily Varying Wiretap Channels with Non-Causal Side Information at the Jammer	121
C.1.1	Exchangeability of Order of Maximization	121
C.1.3	Proof of Lemmas 1.18, 1.23, 1.38, and 2.1	125
C.1.4	Proof of Theorem 2.2	126
C.1.5	Proof of Theorem 2.3	145
C.2	Arbitrarily Varying Wiretap Channels with Constraints	145
C.2.1	Proof of Theorem 2.7	145