

Table of Contents

Acknowledgements	i
Resumen	ii
Resum	iv
Abstract	vi
Plasmonic Metamaterials	1
1.1 Introduction	1
1.2 Surface Plasmons	3
1.2.1. Surface plasmon on planar interfaces.	5
1.3 Metamaterials	9
State of the art	15
2.1 A new phenomenon: Extraordinary transmission	15
2.2 Negative refractive metamaterials	21
EOT and negative index in fishnet metamaterials	25
3.1 Introduction.....	25
3.2 Numerical results	26
3.3 Conclusions	28
Enlarging the negative-index bandwidth by hybridized plasmon resonances.	31
4.1 Introduction.....	31
4.2 Numerical results	32
4.3 Conclusions.....	35
EOT from dielectric-guided modes	37
5.1 Introduction.....	37
5.2 Numerical results	38
5.3 Ultrafast all-optical switching application	40
5.4 Conclusions	40
Implementation of EOT based filters at midinfrared range	41
6.1 Introduction.....	41
6.2 Fabrication and characterization processes.....	43
6.3 Experimental and numerical results	46

6.4	Conclusions	48
	General conclusions and future work	51
7.1	General conclusions.....	51
7.2	Future work.....	53
	References.....	55
	Author's merits.....	69
	Journal Papers.....	69
	Conferences.....	70