

# **Lattice codes and sphere decoding**

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Bachelor's thesis  
Espoo 10.7.2017

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Title: Lattice codes and sphere decoding

Date: 10.7.2017

Language: English

Number of pages: 4+7

Degree programme: Mathematics and Systems analysis

Supervisor: Prof. Camilla Hollanti

Advisors: Prof. Marcus Greferath, postdoc. Oliver Gnilke

Keywords: sphere decoding, lattice codes, information technology

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# Symbols and abbreviations

## Symbols

$\mathbf{B}$	magnetic flux density
$c$	speed of light in vacuum $\approx 3 \times 10^8$ [m/s]
$\omega_D$	Debye frequency
$\omega_{\text{latt}}$	average phonon frequency of lattice
$\uparrow$	electron spin direction up
$\downarrow$	electron spin direction down

## Operators

$\nabla \times \mathbf{A}$	curl of vector in $\mathbf{A}$
$\frac{d}{dt}$	derivative with respect to variable $t$
$\frac{\partial}{\partial t}$	partial derivative with respect to variable $t$
$\sum_i$	sum over index $i$
$\mathbf{A} \cdot \mathbf{B}$	dot product of vectors $\mathbf{A}$ and $\mathbf{B}$

## Abbreviations

AC	alternating current
APLAC	an object-oriented analog circuit simulator and design tool (originally Analysis Program for Linear Active Circuits)
BCS	Bardeen-Cooper-Schrieffer
DC	direct current
TEM	transverse eletromagnetic

# 1 Introduction

## 2 Lattices in communications technology

### 2.1 Closest vector problem

### 3 Sphere decoder

## 4 Simulations and results



## 5 Summary

## References

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