UNIVERSITY OF AMSTERDAM

UvA-DARE (Digital Academic Repository)

Grothendieck inequalities, nonlocal games and optimization

Briët, J.

Publication date
2011

Link to publication

Citation for published version (APA):
Briët, J. (2011). *Grothendieck inequalities, nonlocal games and optimization*. [Thesis, fully internal, Universiteit van Amsterdam]. Institute for Logic, Language and Computation.

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, P.O. Box 19185, 1000 GD Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (https://dare.uva.nl)

Download date:08 Jun 2026

List of symbols

$\mathbb{N}$: The positive integers $1, 2, 3, \ldots$.
$[n]$: The set $\{1, \ldots, n\}$.
$[n]^N$: The cartesian product of $[n]$ with itself N times.
$\mathbb{Z}$: The integers $\ldots, -2, -1, 0, 1, 2, \ldots$.
$\mathbb{R}$: The real numbers.
$\mathbb{R}_+$: The real nonnegative numbers.
$\mathbb{C}$: The complex numbers.

$\ell_2(\mathbb{R})$: The Hilbert space of real square-summable sequences.
$\ell_2(\mathbb{C})$: The Hilbert space of complex square-summable sequences.
S^{n-1}: The real n-dimensional unit sphere.
S^∞: The unit sphere of $\ell_2(\mathbb{R})$.
$S_{\mathbb{C}}^{n-1}$: The complex n-dimensional unit sphere.
$B_{\mathcal{V}}$: The unit ball of normed vector space $\mathcal{V}$.
$\mathcal{S}_n^+$: Cone of n-by-n positive semidefinite matrices
$\mathcal{O}(\mathcal{H})$: The set of $\{-1, 1\}$-valued observables on Hilbert-space $\mathcal{H}$.

ϑ: The Lovász theta number

$\mathrm{SDP}_r(A)$: See Definition 2.1.
$\mathrm{SDP}_r(G, A)$: See Definition 2.3.4.
OPT: See Definition 2.6.
GIP: See Definition 2.7.

K_G: The (real) Grothendieck constant.
$K_G^{\mathbb{C}}$: The complex Grothendieck constant.
$K_G(q \mapsto r)$: See Definition 2.3.1
$K_G^{\succeq}(q \mapsto r)$: See Defintion 2.3.2
$K_G^{L}(q \mapsto r)$: See Definition 2.3.3
$K(G)$: The Grothendieck constant of graph G (See Section 2.3.2).
$K(r, G)$: The rank-r Grothendieck constant of graph G (See Section 2.3.2).
$K(q \mapsto r, G)$: See Definition 2.3.5.

$\mathcal{G}$: Nonlocal game
$\beta(\pi, \Sigma)$: The classical bias of XOR game $\mathcal{G} = (\pi, \Sigma)$
$\beta^*(\pi, \Sigma)$: The entangled bias of XOR game $\mathcal{G} = (\pi, \Sigma)$
$\beta^*_{|\psi\rangle}(\pi, \Sigma)$: The entangled bias of XOR game $\mathcal{G} = (\pi, \Sigma)$ where the players share state $|\psi\rangle$

$\circ$: The entry-wise multiplication for matrices and tensors.
$\sim$: "Distributed according to"
$\langle x_1, x_2, \cdots, x_N \rangle$: The generalized inner product of $x_1, \ldots, x_N \in \mathbb{C}^d$. See Section 2.3.4.