Geometric Algebra Palette

Initialize Geometric Algebra

Algebra Type

(•) Clifford ( ) Grassmann

Signature Type (e.g., $e_1^2 = +1$, $e_k^2 = -1$ for $k > 1$)

(•) Mathematicians: − + + + ( ) Physicists: + − − −

# of time dimensions: 0 (space), 1 (spacetime)

0

Notebook 'Needs' Statement

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Needs[GeomAlg2019Aug`]
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Typing Aids: Subscripts & Operators

e_1	e_2	e_3	e_4	$e_{\square}$	$\circ$	$\wedge$	$\cdot$	$\odot$	$\sqsupset$	$\sqsubset$
$a_{\square}$	$b_{\square}$	$c_{\square}$	$d_{\square}$	$r_{\square}$	$s_{\square}$	$t_{\square}$	$x_{\square}$	$y_{\square}$	$z_{\square}$	$\blacksquare_{\square}$

Typing Aids: Multivector Generators

AtomG[1,2,4]	$e_1 e_2 e_4$
nVectorG[x,3]	$e_1 x_1 + e_2 x_2 + e_3 x_3$
BiVectorG[3]	$(-a_2 b_1 + a_1 b_2)\, e_1 e_2 + (-a_3 b_1 + a_1 b_3)\, e_1 e_3 + (-a_3 b_2 + a_2 b_3) e_2 e_3$
pBladeG[2,3]	$(-a_2 b_1 + a_1 b_2)\, e_1 e_2 + (-a_3 b_1 + a_1 b_3)\, e_1 e_3 + (-a_3 b_2 + a_2 b_3)\, e_2 e_3$
SliceG[a,2,4]	$e_1 e_2 a_{1,2} + e_1 e_3 a_{1,3} + e_1 e_4 a_{1,4} + e_2 e_3 a_{2,3} + e_2 e_4 a_{2,4} + e_3 e_4 a_{3,4}$
nClifG[b,3]	$b_0 + b_1 e_1 + b_2 e_2 + b_3 e_3 + e_1 e_2 b_{1,2} + e_1 e_3 b_{1,3} + e_2 e_3 b_{2,3} + e_1 e_2 e_3 b_{1,2,3}$
EvenClifG[c,3]	$c_0 + e_1 e_2 c_{1,2} + e_1 e_3 c_{1,3} + e_2 e_3 c_{2,3}$
PseudoScalarG[5]	$e_1 e_2 e_3 e_4 e_5$
RotorG[2, 4, $\frac{\pi}{2}$]	$\text{Cos}[\frac{\pi}{4}] + \text{Sin}[\frac{\pi}{4}]\, e_2 e_4$
ComplexG[a,b]	$a + b\, i$
QuaternionG[a,b,c,d]	$a + b\, i + c\, j + d\, k$

Geometric Algebra Operations

GeomPrdtG[clif1,clif2]	WedgePrdtG[clif1, clif2]
DotPrdtG[clif1, clif2]	ScalarPrdtG[clif1, clif2]
LeftContractionG[clif1, clif2]	RightContractionG[clif1 ,clif2]
HodgeDualG[clif, n]	HodgeDual2G[clif, n]
GormG[clif]	NormG[clif]
ReverseG[clif]	InverseG[clif]

Multivector Support

ExpandG[clif]	CollectG[clif]
InitializeG[clif]	MaxDimG[clif]
ConstantG[clif]	FreeTermG[clif]
pSliceG[clif, p]	AtomCoefG[clif,atom]

List Operations and Support

ClifToListG[clif]	ListToClifG[clifList]
eSubscriptListG[clif]	SubscriptListG[clif]
GradeListG[clif]	SignatureG[prdtClifList]