

Grassmann Calculus

Grassmann Calculus is an Application for Grassmann algebra and calculus. The Grassmann algebra contains exterior, regressive, interior, generalized, Clifford, and hypercomplex products. The Grassmann complement is a generalized Hodge star operator. The calculus routines include vector operators, the exterior derivative and the generalized vector calculus operators.

There are various built-in spaces with their associated coordinates, bases (vector, form and orthonormal), metrics and symbols. It's possible to define spaces and then switch between various spaces on the fly.

Grassmann Calculus is thus a powerful application for work in differential geometry, physics and engineering.

The GrassmannCalculus Palette, available from the *Mathematica* Palettes menu is very useful when using the application. Another useful palette is the Common Grassmann Operations palette available from the GrassmannCalculus Palette, drop-down Palettes menu.

The extended Grassmann algebra theory and routines were developed by John Browne. The calculus routines were written by David Park who also designed the user interface.

Grassmann Associations: Spaces, Coordinates, Metrics, Symbols

The Exterior Product

The Regressive Product

The Grassmann Complement

The Interior Product

The Grassmann Generalized Product

Contraction on Forms

Calculus

Expressions: Grassmann Products and Testing

Grade: Routines for analyzing, testing and manipulating graded expressions.

Simplification: Simplifying Grassmann expressions.

Composers: Composing various Grassmann expressions.

Converters: Converting between various Grassmann product and complement forms.

Extractors: Extracting Grassmann symbols and elements from expressions.

Common Factor: Common Factor Theorems and Routines.

Factorization: Basically ExteriorProduct Factorizations.

Axiom Rules and Formulas

Palettes

Linear Equations

Grassmann Algebra Volume 1: Foundations by John Browne

Guide Pages - Temporary Old Links