

User Manual 3.3 Parallelepipeds

De Wiki

Aller à : [navigation](#), [rechercher](#)

[User Manual 3.3 Parallelepipeds](#)

Sommaire

- [1 Definition](#)
- [2 Implementation](#)
- [3 Instantiation](#)
- [4 Usage](#)

Definition

The parallelepipeds are rectangles defined in a 3D space by their centre and a local orthogonal frame (U, V, W).

- The normalized U vector defines the "length" direction
- The normalized V vector defines the "width" direction
- The normalized W vector defines the "height" direction

The four corners and faces can be retrieved in the following orders :



Implementation

The Parallelepiped object implements the [SolidShape interface](#). Please refer to the [Parallelepiped javadoc](#) for a complete list of public methods.

Instantiation

The parallelepiped object is built from a centre (Vector3D), two vectors (Vector3D) to describe its orientation, and three dimensions :

```
Vector3D center = new Vector3D(1.0, 1.0, 1.0);
Vector3D uVector = new Vector3D(1.0, 1.0, 0.0);
Vector3D inputvVector = new Vector3D(-5.0, 1.0, 0.0);
Parallelepipedparallelepiped= new Parallelepiped(center, uVector,
inputvVector, 4.0, 6.0, 2.0);
```

The local frame of the plate is build from the two orientation vector :

- U is the first once normalized (uVector)
- V is the vector computed to be orthogonal to U in the plane define by the two given vectors, in the direction of inputvVector.
- W is computed by cross product of U and V

Usage

Please refer to the [MAT_GEO_Home#HInteractions Interactions with other geometrical objects section] for methods inherited from the Shape interface.

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« http://patrius.cnes.fr/index.php?title=User_Manual_3.3_Parallelepipeds&oldid=1639 »

Menu de navigation

Outils personnels

- [3.133.138.129](#)
- [Discussion avec cette adresse IP](#)
- [Créer un compte](#)
- [Se connecter](#)

Espaces de noms

- [Page](#)
- [Discussion](#)

Variantes

Affichages

- [Lire](#)
- [Voir le texte source](#)
- [Historique](#)
- [Exporter en PDF](#)

Plus

Rechercher

	Rechercher	Lire
----------------------	---	-------------------------------------

PATRIUS

- [Welcome](#)

Evolutions

- [Main differences between V4.15 and V4.14](#)
- [Main differences between V4.14 and V4.13](#)
- [Main differences between V4.13 and V4.12](#)
- [Main differences between V4.12 and V4.11](#)
- [Main differences between V4.11 and V4.10](#)
- [Main differences between V4.10 and V4.9](#)
- [Main differences between V4.9 and V4.8](#)
- [Main differences between V4.8 and V4.7](#)
- [Main differences between V4.7 and V4.6.1](#)
- [Main differences between V4.6.1 and V4.5.1](#)
- [Main differences between V4.5.1 and V4.4](#)
- [Main differences between V4.4 and V4.3](#)
- [Main differences between V4.3 and V4.2](#)
- [Main differences between V4.2 and V4.1.1](#)
- [Main differences between V4.1.1 and V4.1](#)
- [Main differences between V4.1 and V4.0](#)
- [Main differences between V4.0 and V3.4.1](#)

User Manual

- [User Manual 4.15](#)
- [User Manual 4.14](#)
- [User Manual 4.13](#)
- [User Manual 4.12](#)
- [User Manual 4.11](#)
- [User Manual 4.10](#)
- [User Manual 4.9](#)
- [User Manual 4.8](#)
- [User Manual 4.7](#)
- [User Manual 4.6.1](#)
- [User Manual 4.5.1](#)
- [User Manual 4.4](#)
- [User Manual 4.3](#)
- [User Manual 4.2](#)
- [User Manual 4.1](#)
- [User Manual 4.0](#)
- [User Manual 3.4.1](#)
- [User Manual 3.3](#)

Tutorials

- [Tutorials 4.15](#)
- [Tutorials 4.14](#)
- [Tutorials 4.13.5](#)
- [Tutorials 4.12.1](#)
- [Tutorials 4.8.1](#)
- [Tutorials 4.5.1](#)

- [Tutorials 4.4](#)
- [Tutorials 4.1](#)
- [Tutorials 4.0](#)

Links

- [CNES freeware server](#)

Navigation

- [Accueil](#)
- [Modifications récentes](#)
- [Page au hasard](#)
- [Aide](#)

Outils

- [Pages liées](#)
- [Suivi des pages liées](#)
- [Pages spéciales](#)
- [Adresse de cette version](#)
- [Information sur la page](#)
- [Citer cette page](#)
- Dernière modification de cette page le 4 avril 2018 à 13:37.
- [Politique de confidentialité](#)
- [À propos de Wiki](#)
- [Avertissements](#)
- 