

# User Manual 3.3 Infinite Rectangle Cylinder

De Wiki

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

[User Manual 3.3 Infinite Rectangle Cylinder](#)

## Sommaire

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

### Definition

The infinite rectangle cylinders are defined in a 3D space by their axis (a line or two equivalent vectors origin and direction), the direction of their local frame U vector and their two dimensions (length on the U axis and width on V) :



### Implementation

The Infinite Rectangle Cylinder object in the SIRIUS library implements the [infinite cylinder interface](#) and has the following constructor and public methods :

- InfiniteEllipticCylinder(Vector3D, Vector3D, double, double)
- intersects(Line) : boolean
- getIntersectionPoints(Line) : Vector3D[]
- closestPointTo(Line) : Vector3D[]
- distanceTo(Line) : double

Please refer to the [Javadoc](#) for a complete list of public methods.

### Instantiation

The object is built from three vectors (Vector3D) and two doubles :

```
Vector3D origin = new Vector3D(1.0, 1.0, 1.0);
Vector3D direction = new Vector3D(2.0, 0.0, 0.0);
Vector3D inputUvector = new Vector3D(1.0, 1.0, 0.0);
double length = 2.0;
double width = 4.0;
InfiniteRectangleCylindercylinder = new InfiniteRectangleCylinder(origin,
direction, inputUvector, length, width);
```

Or directly from a Line, a non-colinear vector and two doubles :

```
Line axis = new Line(origin, direction);
```

```
Vector3D inputUvector = new Vector3D(1.0, 1.0, 0.0);
double length = 2.0;
double width = 4.0;
InfiniteRectangleCylinder cylinder = new InfiniteRectangleCylinder(axis,
inputUvector, length, width);
```

The local frame is built such as :

- The axis is the W vector
- U is orthogonal to W and its direction is defined by the 'input U vector'
- V completes the frame

## 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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## Menu de navigation

### Outils personnels

- [3.142.201.93](#)
- [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

## 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](#)

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- [Politique de confidentialité](#)
- [À propos de Wiki](#)
- [Avertissements](#)

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