

# Package ‘SoilFDA’

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**Type** Package

**Title** Fractal Dimension Analysis of Soil Particle Size Distribution

**Version** 0.1.0

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## Description

Function for the computation of fractal dimension based on mass of soil particle size distribution by Tyler & Wheatcraft (1992) <[doi:10.2136/sssaj1992.03615995005600020005x](https://doi.org/10.2136/sssaj1992.03615995005600020005x)>. It also provides functions for calculation of mean weight and geometric mean diameter of particle size distribution by Perfect et al. (1992) <[doi:10.2136/sssaj1992.03615995005600050012x](https://doi.org/10.2136/sssaj1992.03615995005600050012x)>.

**License** GPL (>= 3)

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fractdim                      *Computation of Fractal Dimension*

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### Description

The function computes the fractal dimension of particle size distribution based on soil mass

### Usage

```
fractdim(Mass, Size, TM, dmax)
```

### Arguments

Mass	Numerical vector containing the mass of each particle size class
Size	Numerical vector containing the average of each particle size class
TM	Numerical value containing the total mass of soil
dmax	Numerical value containing the average of maximum particle size class

### Value

Fractal Dimension

### References

Tyler S. W., Wheatcraft S. W. (1992). Fractal scaling of soil particle size distribution: Analysis and limitations. *Soil Sci. Soc. Am. J.*, 56: 362.

### Examples

```
data <- data.frame(Mass = c(15.1,28.9,11.3,14.6,7.9,22.2),
                  Size = c(0.053,0.1765,0.4,1.25,3.375,4.75))
TM <- 100
dmax <- 4.75
attach(data)
fractdim(Mass = Mass, Size = Size, TM = TM, dmax = dmax)
```

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GMD *Geometric Mean Diameter*

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**Description**

The function computes the geometric mean diameter of particle size distribution

**Usage**

```
GMD(Mass, Size)
```

**Arguments**

Mass	Numerical vector containing the mass of each particle size class
Size	Numerical vector containing the average of each particle size class

**Value**

Geometric Mean Diameter

**References**

Perfect E, Rasiyah V, Kay BD. (1992). Fractal Dimension of soil aggregate size distributions calculated on number and mass. Soil Science Society of America Journals, 56: 1407.

**Examples**

```
data <- data.frame(Mass = c(15.1,28.9,11.3,14.6,7.9,22.2),  
                  Size = c(0.053,0.1765,0.4,1.25,3.375,4.75))  
attach(data)  
GMD(Mass = Mass, Size = Size)
```

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MWD *Mean Weight Diameter*

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**Description**

The function computes the mean weight diameter of particle size distribution

**Usage**

```
MWD(Mass, Size)
```

**Arguments**

Mass	Numerical vector containing the mass of each particle size class
Size	Numerical vector containing the average of each particle size class

**Value**

Mean Weight Diameter

**References**

Perfect E, Rasiyah V, Kay BD. (1992). Fractal Dimension of soil aggregate size distributions calculated on number and mass. Soil Science Society of America Journals, 56: 1407.

**Examples**

```
data <- data.frame(Mass = c(15.1,28.9,11.3,14.6,7.9,22.2),  
                  Size = c(0.053,0.1765,0.4,1.25,3.375,4.75))  
attach(data)  
MWD(Mass = Mass, Size = Size)
```

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