Package 'RLeafAngle'

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Type Package

Title Estimates, Plots and Evaluates Leaf Angle Distribution Functions, Calculates Extinction Coefficients

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Description Leaf angle distribution is described by a number of functions (e.g. ellipsoidal, Beta and rotated ellipsoidal). The parameters of leaf angle distributions functions are estimated through different empirical relationship. This package includes estimations of parameters of different leaf angle distribution function, plots and evaluates leaf angle distribution functions, calculates extinction coefficients given leaf angle distribution. Reference: Wang(2007)<doi:10.1016/j.agrformet.2006.12.003>.

License GPL

Imports stats

Depends

Suggests

RoxygenNote 6.0.1

NeedsCompilation no

Repository CRAN

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R topics documented:

`BetaDis` *Compute the Beta distribution of leaf zenith angle.*

Description

Compute the Beta distribution of leaf zenith angle.

Usage

```
BetaDis(meu, neu)
```

Arguments

`meu`	One of the parameters for Beta function.
`neu`	One of the parameters for Beta function.

Value

The Beta distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-BetaDis(1.616,2.188)
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~(""^"o")), ylab="Leaf area freqency")
```

`computeBeta` *Compute the parameter of Beta function given leaf angle distribution mearuements.*

Description

Compute the parameter of Beta function given leaf angle distribution mearuements.

Usage

```
computeBeta(LeafAngles)
```

Arguments

`LeafAngles`	The measurements of leaf angle distribution.

Value

The two parameters of Beta function given leaf angle distribution mearuements.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
data(Pisek)
computeBeta(Pisek[[2]])
```

`computeG` *Compute the mean projection of unit leaf area on the plane perpendicular to beam direction, namely, G parameter.*

Description

Compute the mean projection of unit leaf area on the plane perpendicular to beam direction, namely, G parameter.

Usage

```
computeG(LeafAngleZ, FractionZ, LeafAngleA, FractionA, theta, alpha)
```

Arguments

`LeafAngleZ`	The center angles list of leaf zenith angle intervals.
`FractionZ`	The leaf area fraction list given leaf zenith angle intervals list.
`LeafAngleA`	The center angles list of leaf azimuth angle intervals.
`FractionA`	The leaf area fraction list given leaf azimuth angle intervals list.
`theta`	The zenith angle of beam direction.
`alpha`	The azimuth angle of beam direction.

Value

The mean projection of unit leaf area on the plane perpendicular to beam direction, namely, G value.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
angleZ<-c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5)
angleA<-c(10,30,50,70,90,110,130,150,170,190,210,230,250,270,290,310,330,350)
sADis<-sysAziDis()
sZDis<-sphericalDis()
for(solarZenith in 10:80)
{
  print(computeG(angleZ,sZDis,angleA,sADis,solarZenith,40))
}
```

`computeGEllip` *Compute the G value given lamda (the parameter of ellipsoidal function) and beam direction.*

Description

Compute the G value given lamda (the parameter of ellipsoidal function) and beam direction.

Usage

```
computeGEllip(lambda, theta)
```

Arguments

`lambda`	The parameter of ellipsoidal function given leaf angle distribution mearuements.
`theta`	The zenith angle of beam direction.

Value

The G value.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
computeGEllip(1.0, 30)
```

computeLambda *Compute the parameter of ellipsoidal function given leaf angle distribution mearuements.*

Description

Compute the parameter of ellipsoidal function given leaf angle distribution mearuements.

Usage

```
computeLambda(LeafAngles)
```

Arguments

LeafAngles	The measurements of leaf angle distribution.

Value

The parameter of ellipsoidal function given leaf angle distribution mearuements.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
data(Pisek)
computeLambda(Pisek[[2]])
```

computeLambdaR *Compute the parameter of rotated-ellipsoidal function given leaf angle distribution mearuements.*

Description

Compute the parameter of rotated-ellipsoidal function given leaf angle distribution mearuements.

Usage

```
computeLambdaR(LeafAngles)
```

Arguments

LeafAngles	The measurements of leaf angle distribution.

Value

The parameter of ellipsoidal function given leaf angle distribution meauements.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
data(Pisek)
computeLambdaR(Pisek[[2]])
```

---

computeSunlit — *Compute the fraction of sunlit folige given solar position, LAI and G value with the assumption of the symmetric distribution of leaf azimuth angle.*

Description

Compute the fraction of sunlit folige given solar position, LAI and G value with the assumption of the symmetric distribution of leaf azimuth angle.

Usage

```
computeSunlit(Theta, G, LAI)
```

Arguments

Theta	Solar zenith angle.
G	The G value, namely the projection of foliage area.
LAI	Leaf area index.

Value

The fraction of sunlit foliage.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
computeSunlit(30, 0.5, 2.0)
```

`computeTrig` *Compute the parameter of Verhoef's leaf angle distribution given leaf angle mearuements.*

Description

Compute the parameter of Verhoef's leaf angle distribution given leaf angle distribution mearuements.

Usage

```
computeTrig(LeafAngles)
```

Arguments

`LeafAngles`	The measurements of leaf angle distribution.

Value

The two parameters of Verhoef's leaf angle distribution.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
data(Pisek)
computeTrig(Pisek[[2]])
```

`ellipsoidalDis` *Compute the ellipsoidal distribution of leaf zenith angle.*

Description

Compute the ellipsoidal distribution of leaf zenith angle.

Usage

```
ellipsoidalDis(lambda)
```

Arguments

`lambda`	The parameter of ellipsoidal function.

Value

The ellipsoidal distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-ellipsoidalDis(1)
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~(""^"o")), ylab="Leaf area freqency")
```

`ellipsoidalRDis` *Compute the rotated ellipsoidal distribution of leaf zenith angle.*

Description

Compute the rotated ellipsoidal distribution of leaf zenith angle.

Usage

```
ellipsoidalRDis(lambdaR)
```

Arguments

lambdaR	The parameter of rotated-ellipsoidal function.

Value

The rotated ellipsoidal distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-ellipsoidalRDis(1)
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~(""^"o")), ylab="Leaf area freqency")
```

---

estBeta *Estimate the parameters of Beta distribution given leaf angle measurements.*

Description

Estimate the parameters of Beta distribution given leaf angle measurements.

Usage

```
estBeta(LeafAngles)
```

Arguments

LeafAngles	The leaf angle measurements.

Value

the parameters of Beta distribution.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
angleZ<-c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5)
angleA<-c(10,30,50,70,90,110,130,150,170,190,210,230,250,270,290,310,330,350)
sADis<-sysAziDis()
sZDis<-sphericalDis()
for(solarZenith in 10:80)
{
  print(computeG(angleZ,sZDis,angleA,sADis,solarZenith,40))
}
```

`extremophileDis` *Compute the extremophile distribution of leaf zenith angle.*

Description

Compute the extremophile distribution of leaf zenith angle.

Usage

```
extremophileDis()
```

Value

The extremophile distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-extremophileDis()
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~("°")), ylab="Leaf area freqency")
```

Falster — *Leaf angle distribution measurements provided by D.S. Falster*

Description

Leaf angle distribution data measured in two sites of Ku-ringgai Chase National Park, Sydney, Australia and provided by Dr. D.S. Falster of Macquarie University, Australia

Usage

```
data(Falster)
```

Format

A list with 39 arrays where one array for tree specy name and 38 array of leaf angle distribution for each specy.

Details

Leaf angle distribution measurements provided by D.S. Falster

Author(s)

W.-M. Wang (wmwangATgmail.com)

Source

Falster, D. and Westoby, M., 2003. Leaf size and angle vary widely across species: what consequences for light interception? New Phytol.158, 509-525.

Examples

```
data(Falster)
Falster[1]
```

interBeta — *Compute the fraction leaf area given leaf angle intervals (in degree) and the parameters of Beta function.*

Description

Compute the fraction leaf area given leaf angle intervals (in degree) and the parameters of Beta function.

Usage

```
interBeta(AngleLower, AngleUpper, meu, neu)
```

Arguments

AngleLower	The lower limit of leaf angle intervals in degree.
AngleUpper	The upper limit of leaf angle intervals in degree.
meu	One of the parameters for Beta function.
neu	One of the parameters for Beta function.

Value

Compute the fraction leaf area of Beta function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interBeta(40,50,1.616,2.188)
```

---

interEllip *Compute the fraction leaf area given leaf angle intervals (in degree) and the parameters of ellipsoidal function.*

Description

Compute the fraction leaf area given leaf angle intervals (in degree) and the parameters of ellipsoidal function.

Usage

```
interEllip(AngleLower, AngleUpper, lambda)
```

Arguments

AngleLower	The lower limit of leaf angle intervals in degree.
AngleUpper	The upper limit of leaf angle intervals in degree.
lambda	The parameter of ellipsoidal function.

Value

Compute the fraction leaf area of ellipsoidal function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interEllip(40,50,1.1)
```

`interEllipR` *Compute the fraction leaf area for rotated-ellipsoidal function given leaf angle intervals (in degree) and the parameters.*

Description

Compute the fraction leaf area given leaf angle intervals (in degree) and the parameters of rotated-ellipsoidal function.

Usage

```
interEllipR(AngleLower, AngleUpper, lambdaR)
```

Arguments

`AngleLower`	The lower limit of leaf angle intervals in degree.
`AngleUpper`	The upper limit of leaf angle intervals in degree.
`lambdaR`	The parameter of rotated-ellipsoidal function.

Value

Compute the fraction leaf area of rotated-ellipsoidal function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interEllipR(40,50,1.1)
```

`interErectophile` *Compute the fraction leaf area of Erectophile distribution given leaf angle intervals (in degree).*

Description

Compute the fraction leaf area of Erectophile distribution given leaf angle intervals (in degree).

Usage

```
interErectophile(AngleLower, AngleUpper)
```

Arguments

`AngleLower`	The lower limit of leaf angle intervals in degree.
`AngleUpper`	The upper limit of leaf angle intervals in degree.

Value

Compute the fraction leaf area of Erectophile function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interErectophile(40,50)
```

`interExtremophile` *Compute the fraction leaf area of Extremophile distribution given leaf angle intervals (in degree).*

Description

Compute the fraction leaf area of Extremophile distribution given leaf angle intervals (in degree).

Usage

```
interExtremophile(AngleLower, AngleUpper)
```

Arguments

AngleLower	The lower limit of leaf angle intervals in degree.
AngleUpper	The upper limit of leaf angle intervals in degree.

Value

Compute the fraction leaf area of Extremophile function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interExtremophile(40,50)
```

---

interPlagiophile *Compute the fraction leaf area of Plagiophile distribution given leaf angle intervals (in degree).*

Description

Compute the fraction leaf area of Plagiophile distribution given leaf angle intervals (in degree).

Usage

```
interPlagiophile(AngleLower, AngleUpper)
```

Arguments

AngleLower	The lower limit of leaf angle intervals in degree.
AngleUpper	The upper limit of leaf angle intervals in degree.

Value

Compute the fraction leaf area of Plagiophile function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interPlagiophile(40,50)
```

`interPlanophile` *Compute the fraction leaf area of Planophile distribution given leaf angle intervals (in degree).*

Description

Compute the fraction leaf area of Planophile distribution given leaf angle intervals (in degree).

Usage

```
interPlanophile(AngleLower, AngleUpper)
```

Arguments

`AngleLower`	The lower limit of leaf angle intervals in degree.
`AngleUpper`	The upper limit of leaf angle intervals in degree.

Value

Compute the fraction leaf area of Planophile function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interPlanophile(40,50)
```

`interSpherical` *Compute the fraction leaf area of Spherical function given leaf angle intervals (in degree).*

Description

Compute the fraction leaf area of Spherical function given leaf angle intervals (in degree).

Usage

```
interSpherical(AngleLower, AngleUpper)
```

Arguments

`AngleLower`	The lower limit of leaf angle intervals in degree.
`AngleUpper`	The upper limit of leaf angle intervals in degree.

Value

Compute the fraction leaf area of Spherical function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interSpherical(40,50)
```

`interUniform` *Compute the fraction leaf area of Uniform distribution given leaf angle intervals (in degree).*

Description

Compute the fraction leaf area of Uniform distribution given leaf angle intervals (in degree).

Usage

```
interUniform(AngleLower, AngleUpper)
```

Arguments

AngleLower	The lower limit of leaf angle intervals in degree.
AngleUpper	The upper limit of leaf angle intervals in degree.

Value

Compute the fraction leaf area of Uniform function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
interUniform(40,50)
```

---

intervalTrig *Compute the fraction leaf area given leaf angle intervals (in degree) and the parameters of Verhoef's leaf angle distribution function.*

Description

Compute the fraction leaf area given leaf angle intervals (in degree) and the parameters of Verhoef's leaf angle distribution function.

Usage

```
intervalTrig(AngleLower, AngleUpper, ap, bp)
```

Arguments

AngleLower	The lower limit of leaf angle intervals in degree.
AngleUpper	The upper limit of leaf angle intervals in degree.
ap	One of the parameters of Verhoef's leaf angle distribution function.
bp	One of the parameters of Verhoef's leaf angle distribution function.

Value

Compute the fraction leaf area of Verhoef's leaf angle distribution function.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
intervalTrig(40,50, -0.325, -0.173)
```

LADdensity *Retrieve the density of leaf area given leaf angle measurements.*

Description

Retrieve the density of leaf area given leaf angle measurements.

Usage

```
LADdensity(LeafAngles)
```

Arguments

LeafAngles	The measurements of leaf angle distribution.

Value

Leaf area density given leaf angle intervals (0,10,20,30,40,50,60,70,80,90).

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
data(Falster)
LADdensity(Falster[[2]])
```

Pisek *Leaf angle distribution measurements provided by Jan Pisek*

Description

Leaf angle distribution data provided by Dr. Tartu Observatory, Department of Remote Sensing, Estonia

Usage

```
data(Pisek)
```

Format

A list with 55 arrays where one array for tree specy name and 54 array of leaf angle distribution for each specy.

Details

Leaf angle distribution measurements provided by Jan Pisek

Author(s)

W.-M. Wang (wmwangATgmail.com)

Source

Pisek, Jan, et al. "Is the spherical leaf inclination angle distribution a valid assumption for temperate and boreal broadleaf tree species?." Agricultural & Forest Meteorology 169.3(2013):186-194.

Examples

```
data(Pisek)
Pisek[1]
```

plagiophileDis *Compute the plagiophile distribution of leaf zenith angle.*

Description

Compute the plagiophile distribution of leaf zenith angle.

Usage

```
plagiophileDis()
```

Value

The plagiophile distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-plagiophileDis()
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~(""^"o")), ylab="Leaf area freqency")
```

`planophileDis` *Compute the planophile distribution of leaf zenith angle.*

Description

Compute the planophile distribution of leaf zenith angle.

Usage

```
planophileDis()
```

Value

The planophile distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-planophileDis()
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~("°")), ylab="Leaf area freqency")
```

`plotdensity` *Plot the density of leaf area given leaf angle measurements.*

Description

Plot the density of leaf area given leaf angle measurements.

Usage

```
plotdensity(LeafAngles, main = "Leaf angle distribution", type = "l",
  pch = 20)
```

Arguments

`LeafAngles`	The measurements of leaf angle distribution.
`main`	An overall title for the plot.
`type`	The type of plot.
`pch`	The symbol of plot.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
data(Pisek)
plotdensity(Pisek[[2]])
```

selectClassic *Retrieve the density of leaf area given leaf angle measurements.*

Description

Retrieve the density of leaf area given leaf angle measurements.

Usage

```
selectClassic(LeafAngles)
```

Arguments

LeafAngles	The measurements of leaf angle distribution.

Value

The classic leaf angle distribution type

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
data(Falster)
selectClassic(Falster[[2]])
```

sphericalDis *Compute the spherical distribution of leaf zenith angle.*

Description

Compute the spherical distribution of leaf zenith angle.

Usage

```
sphericalDis()
```

Value

The spherical distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-sphericalDis()
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~(""^"o")), ylab="Leaf area freqency")
```

---

sysAziDis *Compute the symmetric distribution of leaf azimuth angle.*

Description

Compute the symmetric distribution of leaf azimuth angle.

Usage

```
sysAziDis()
```

Value

The symmetric distribution of leaf azimuth angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
aDis<-sysAziDis()
plot(c(10,30,50,70,90,110,130,150,170,190,210,230,250,270,290,310,330,350), aDis,
xlab=expression(Leaf~azimuth~angle~~(""^"o")), ylab="Leaf area freqency")
```

uniformDis *Compute the uniform distribution of leaf zenith angle.*

Description

Compute the uniform distribution of leaf zenith angle.

Usage

```
uniformDis()
```

Value

The uniform distribution of leaf zenith angle.

Author(s)

Wei-Min Wang (wmwang AT gmail.com)

References

Wang, W. M., Li, Z. L., & Su, H. B. (2007). Comparison of leaf angle distribution functions: effects on extinction coefficient and fraction of sunlit foliage. Agricultural and Forest Meteorology, 143(1), 106-122.

Examples

```
sDis<-sphericalDis()
plot(c(4.5, 13.5, 22.5, 31.5, 40.5, 49.5, 58.5, 67.5, 76.5, 85.5), sDis,
xlab=expression(Leaf~zenith~angle~~("^"o")), ylab="Leaf area freqency")
```

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