Interception

This text is based on the chapter on interception in the monograph on evaporation by Schrödter (1985)

Interception is the rainfall intercepted by leaves and vegetation:

$$N_o = N_f + N_t + N_s + N_i$$

with N_o = precipitation, N_f = throughfall, N_s = stem flow and N_i = interception.

The interception reduces precipitation to the effective precipitation and represents the difference between precipitation and effective precipitation.

$$N_i = N_o - N_e$$

There are several formulae for calculating interception. The formula of Hoyningen-Huene (1980, 1983) is based on precipitation and leaf-area-index:

$$N_i = - 0.42 + 0.245 * N_o + 0.2 * LAI + 0.0271 * N_o * LAI - 0.0111 * {N_o}^2 - 0.0109*{LAI}^2$$

From the above formula the precipitation can be estimated at which the interception store is fully saturated:

$$N_{og} = 11.05 + 1.1223*LAI$$

where N_{og} is a threshold precipitation.

We can also estimate the potential N_{ig} interception with:

$$N_{ig} = 0.935 + 0.498 * LAI - 0.00575*LAI^2$$

As a rule of thumb and for rough estimates, the interception ranges from 8 % to 20% for humid regions and crops and can reach up to 30 % for dence vegetation.

<todo>Fix Python program</todo>

interception.py

```
from pylab import *

def interception(No, LAI):
    icm = 0.935+0.498*LAI-0.00575*LAI*LAI
    ic = -0.42+(0.245*No)+(0.2*LAI)+(0.0271*No*LAI)-(0.0111*No*No)-
(0.0109*LAI*LAI)
    return ic

LAI = 3.0
No = arange(0.0, 25.0, 1.0)
plot(No, interception(No,LAI))
```

```
xtext = xlabel('precipitation (mm/d)')
ytext = ylabel('Interception (mm)')
setp(xtext, size='medium', name='courier', weight='bold', color='g')
setp(ytext, size='medium', name='helvetica', weight='light', color='b')
show()
```