The data are redundantly stored in two different file formats: Plain ASCII (.dat) and NetCDF (.nc). The user may choose which format suits him best.

Description of the Variables

k

k is derived from two simulations of irradiance within the given FOV. One for clear sky I_0 and one for an atmosphere including a cloud (I_α) with optical thickness $\tau = 1.5$ at 550 nm.

$$k = \frac{\log\left(\frac{I_0}{I_\alpha}\right)}{\tau_{550\text{nm}}} \tag{1}$$

I_0 and I_α are broad band (integrated solar) values obtained using the "kato2" parameterization. The different optical property data sets "Baum v2.0", "Baum v3.5" and HEY cover different wavelength ranges. Because of this, the calculations for the different data sets were done with slightly different wavelength ranges. For "Baum v2.0" and "Baum v3.5" it covers 430 nm to 2000 nm. For HEY it goes from 300 nm to 2600 nm. In terms of integrated solar irradiance corrected for molecular absorption the wavelength range for "Baum" covers 82% of the solar spectrum and for HEY it covers 98%.

$k\_max\_rel\_dev$

To check whether the condition $k(\tau) = \text{const.}$ is sufficiently met, k is furthermore calculated at $\tau = 0.5$ and $\tau = 3.0$. Both are compared to $k(\tau = 1.5)$ in terms of absolute values of the relative deviation. The larger of the two relative deviations is stored in the variable $k\_max\_rel\_dev$.

k_MC_err

The values of k are based on Monte Carlo simulations of the irradiance with the model MYSTIC. This means that the results are to some extent prone to Monte Carlo noise. MYSTIC does not only output the result but also the standard deviation σ of the result. From this we calculate an estimate of the Monte Carlo error of k as

$$k_{\max} = \log\left(\frac{I_0 + \sigma(I_0)}{I_\alpha - \sigma(I_\alpha)}\right) \tag{2}$$

$$k_{\min} = \log\left(\frac{I_0 - \sigma(I_0)}{I_\alpha + \sigma(I_\alpha)}\right) \tag{3}$$

$$k\_MC\_err = \frac{k_{\max} - k_{\min}}{k} \tag{4}$$

Reff

Effective radius (in μm) supporting points at which k was tabulated.

FOV

Half-opening angle (in °) supporting points of the field of views for which k was tabulated.

nhabit

nhabit gives the number of the particle shape or particle shape mixture – also called habit – as in the list given given in the NetCDF-File global attribute "habits": habits = agg, col, dro, hol, ros, baumi_v2, baum_v3.5. These stand for aggregates, solid-columns, hollow-columns, rosettes, Baum v2.0 and Baum v 3.5. baum_v2 is also referred to bau and baum_v3.5 is also referred to as b35.