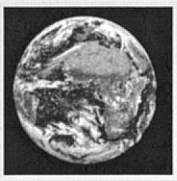
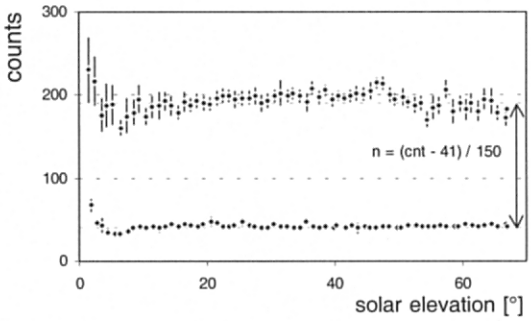
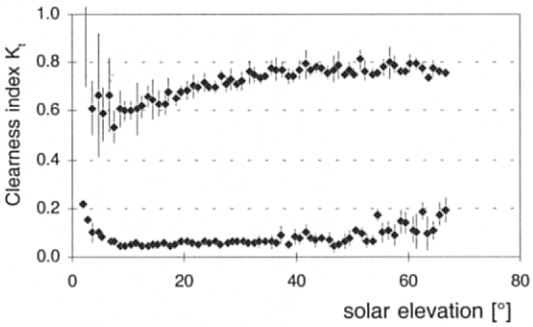


Why a multiparameter model?

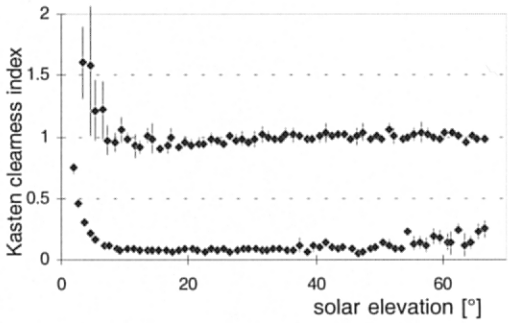
- the counts are corrected for the optical air mass and the backscatter angle effects, a cloud index is derived,



- the ground measurements are normalised to obtain the clearness index



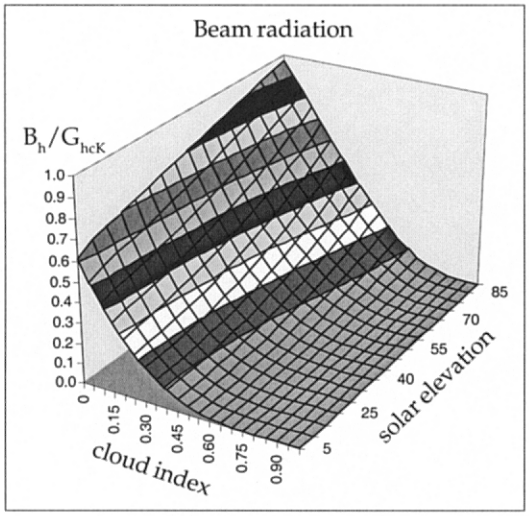
- or using a clear sky model as proposed by Kasten



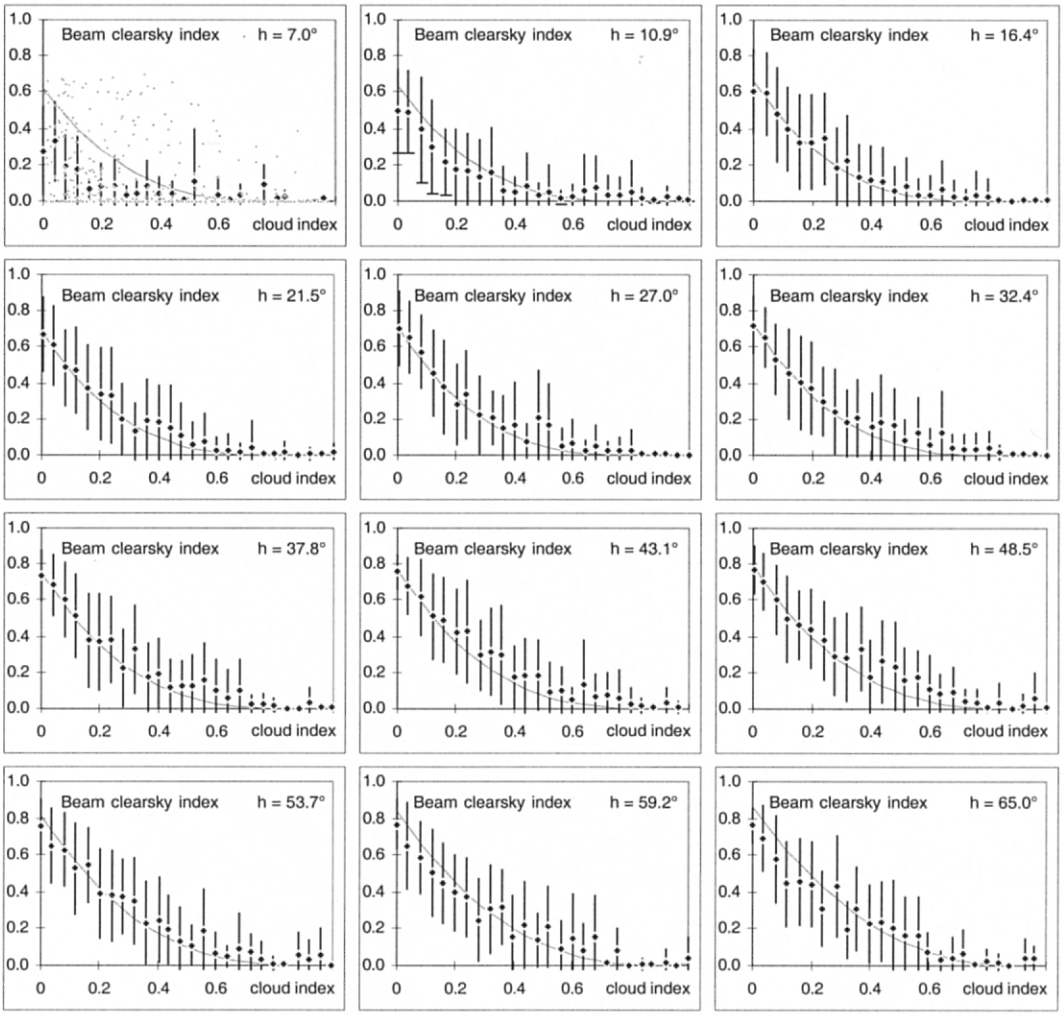
Conclusion

the work done to obtain geometry-independent counts is partly lost by the use of geometry-dependent clearness indices.

Beam model

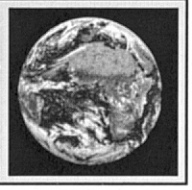


- normalisation with the Kasten clear sky model (the clear sky model includes monthly turbidity values)
- two parameters model: cloud index and solar elevation,
- the model is quadratic with the solar elevation and cubic with the cloud index

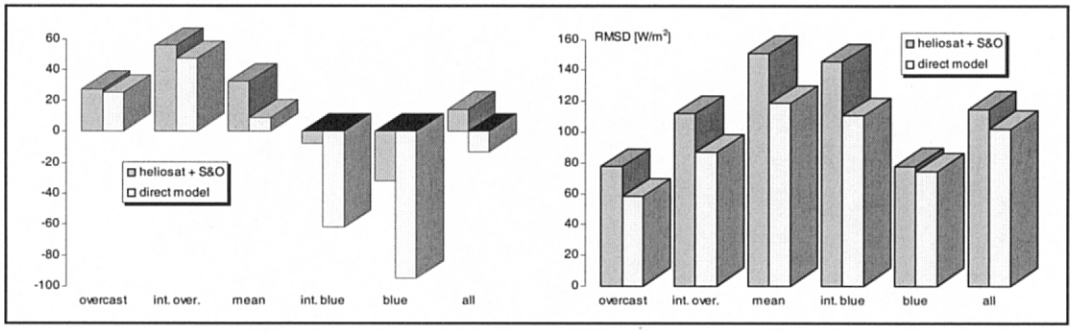


Beam model:
MBD & RMSD results

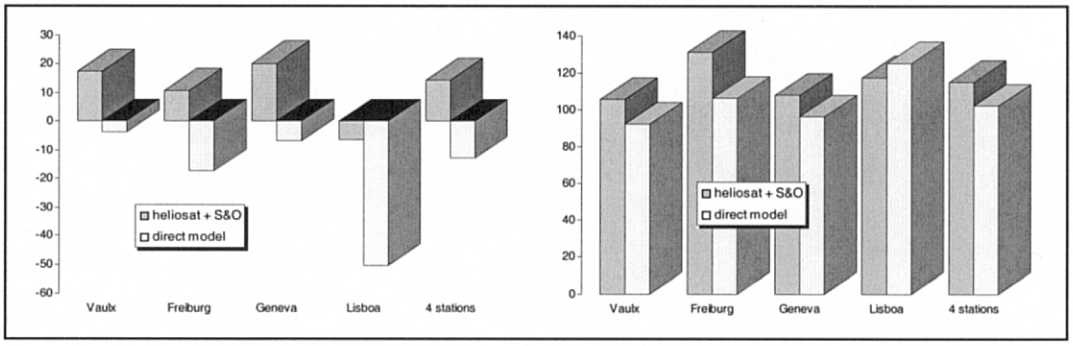
2nd workshop on
Satellites for Solar Energy Assessment



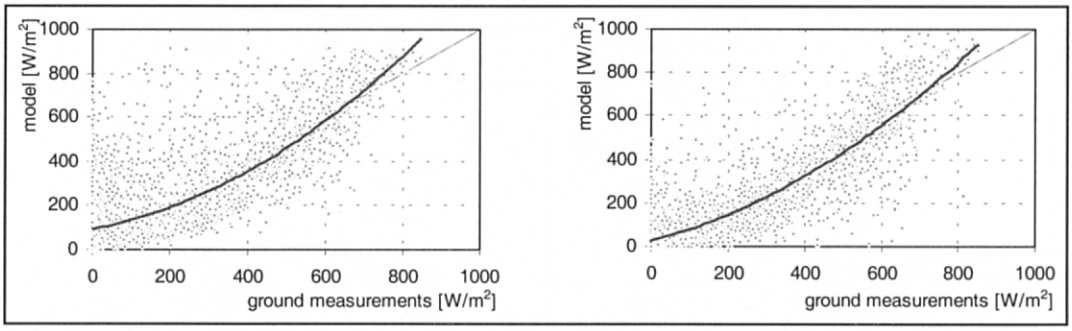
- mean bias difference (MBD) and root mean square difference (RMSD) between model and measurements for five sky types:



- for four european stations:



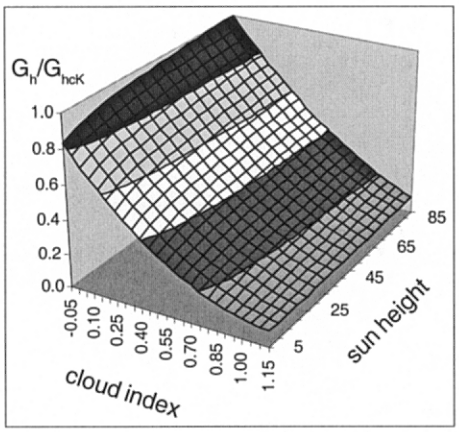
- comparison between two chained models and the direct model:



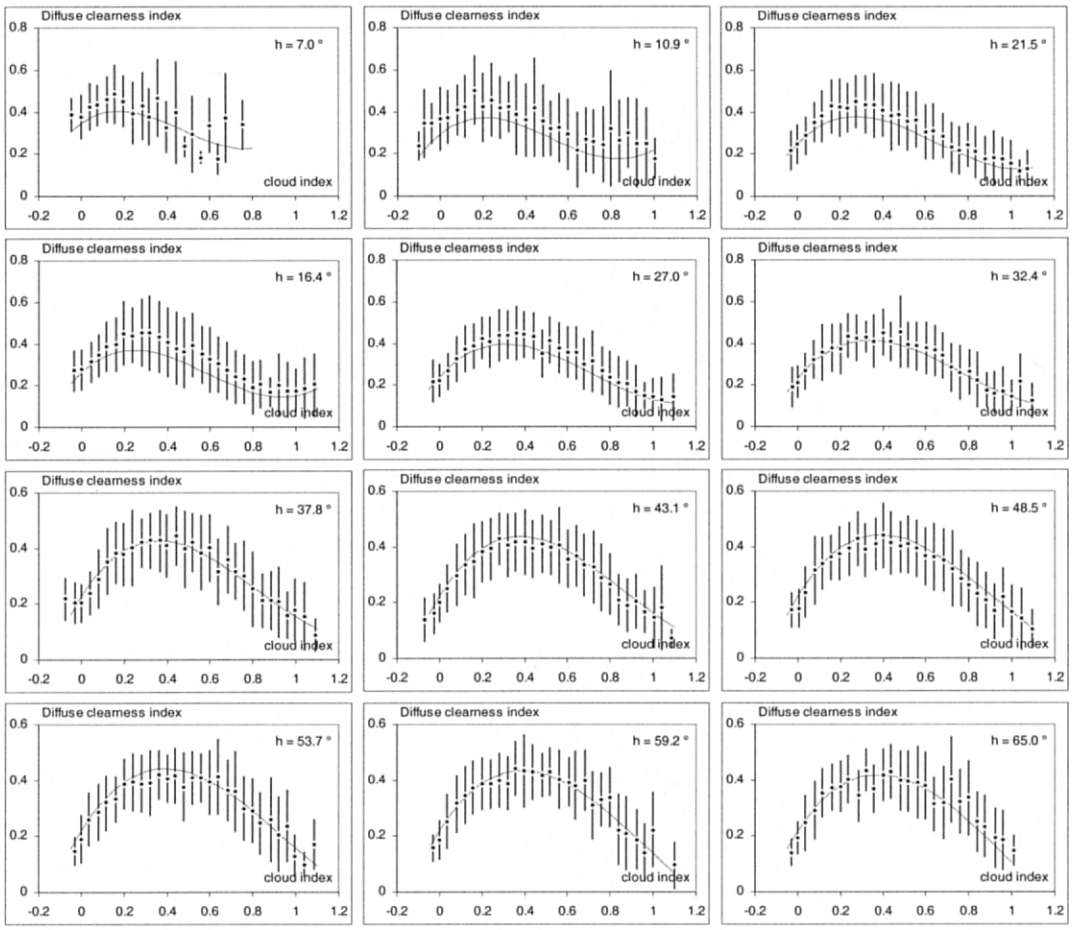
Pierre Ineichen - University of Geneva *Golden January 3, 1999 - 9*

Presentation: Prediction of Non-Global Irradiance Components by Pierre Ineichen

Diffuse and global models



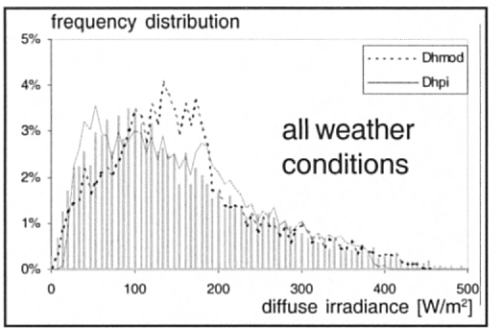
- normalisation with the Kasten clear sky model (the clear sky model includes monthly turbidity values)
- two parameters model: cloud index and solar elevation.

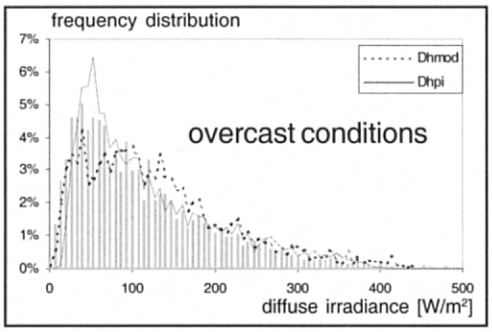


Presentation: Prediction of Non-Global Irradiance Components by Pierre Ineichen

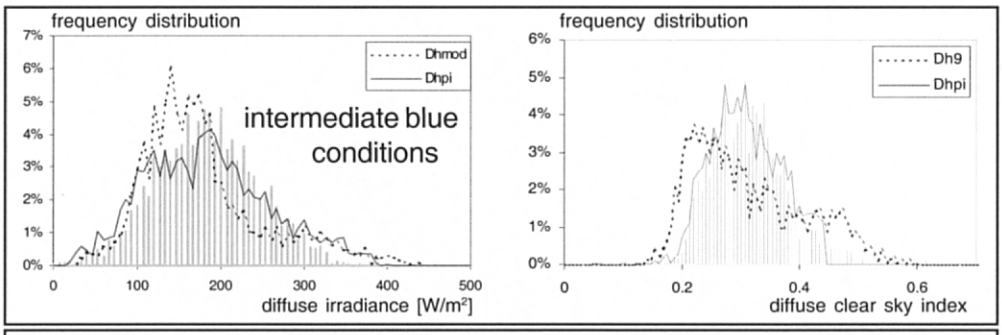
Diffuse model: frequency distribution results

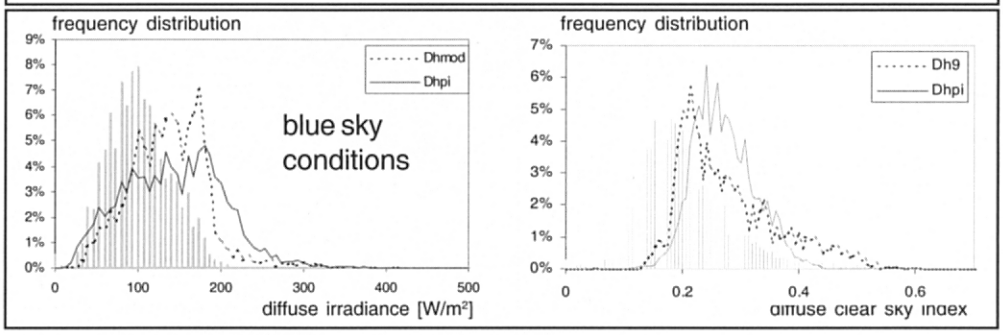
- The frequency distribution analysis can be done in two different ways: in term of radiation or in term of normalized radiation,

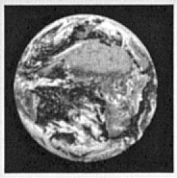




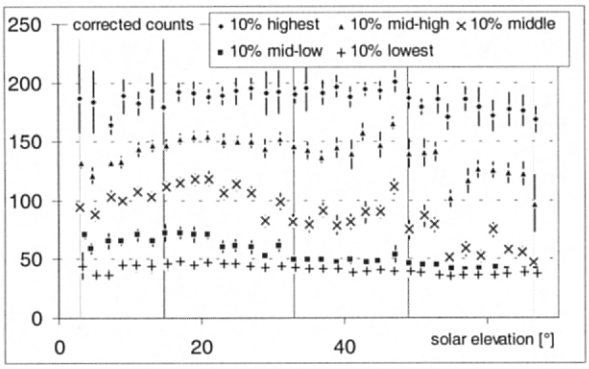
- the absolute radiation frequency distribution gives the probability to have a certain level of radiation: it is the parameter to use when the time distribution of the radiation is not a first priority,
- the relative radiation probability is expressed in term of a radiation level that should occur for a given solar geometry or a given time and day of the year.

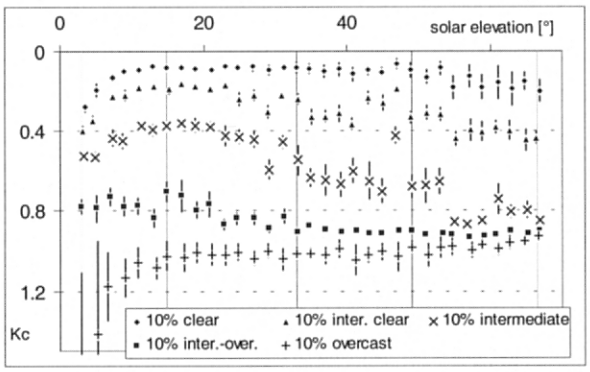


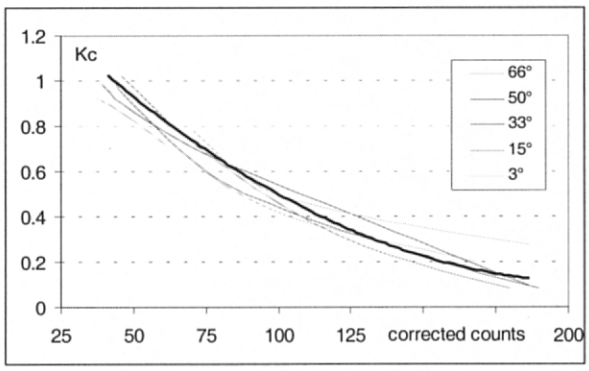




Conclusions







- the evaluation of radiation components from satellite images goes through a correlation between normalized radiations and corrected counts,
- the lowest counts with a very low dispersion correspond to high radiation levels, with high fluctuation, and inversely,
- the relation between the clearness index and the cloud index (or the counts) is not linear (here for the global radiation), and depends on solar elevation,
- this work is a first attempt to evaluate the non-global components directly from a satellite image; it gives slightly better results on a restricted data set. It has to be generalized and assessed.