

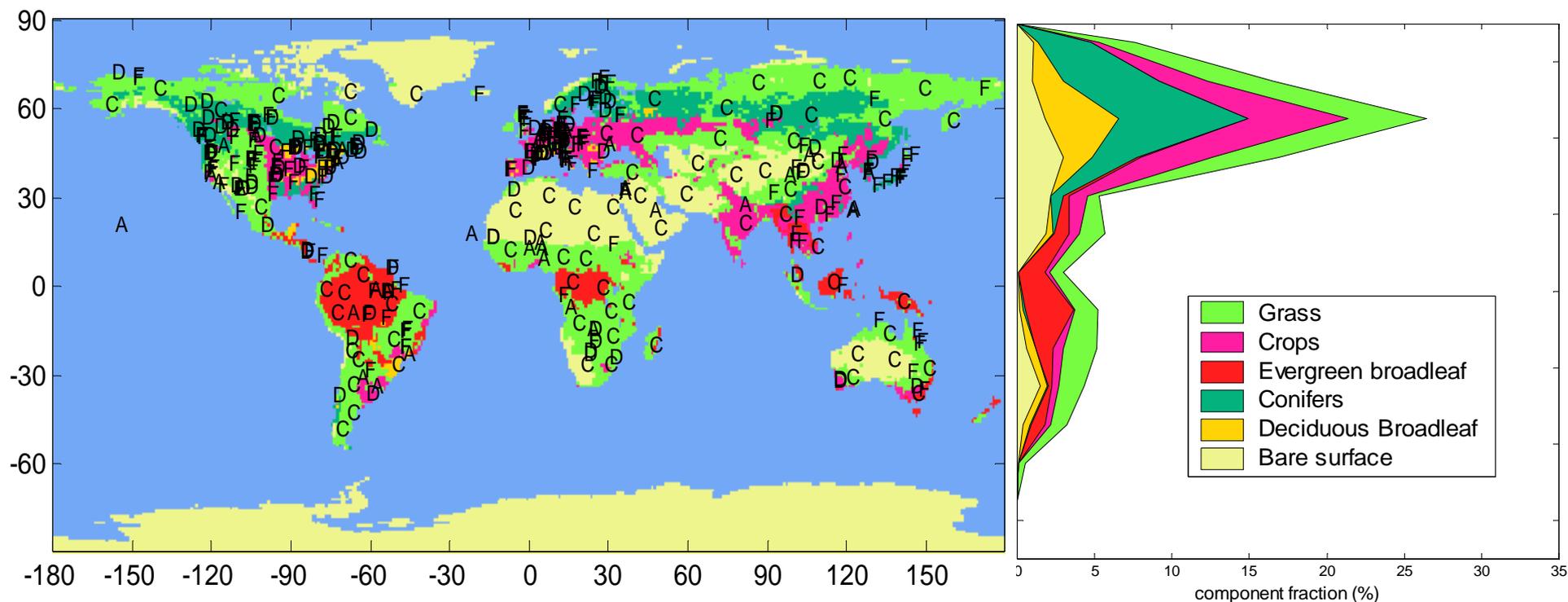
A proposed method for products validation

F. Baret, M. Weiss, S. Garrigues, J. Morissette

Indirect validation: self consistency and comparison with other products

- Temporal continuity (and spatial!)
- Temporal consistency
- Statistical distributions
- Scatterplots
- Transects, Maps.....

The BELMANIP network of sites



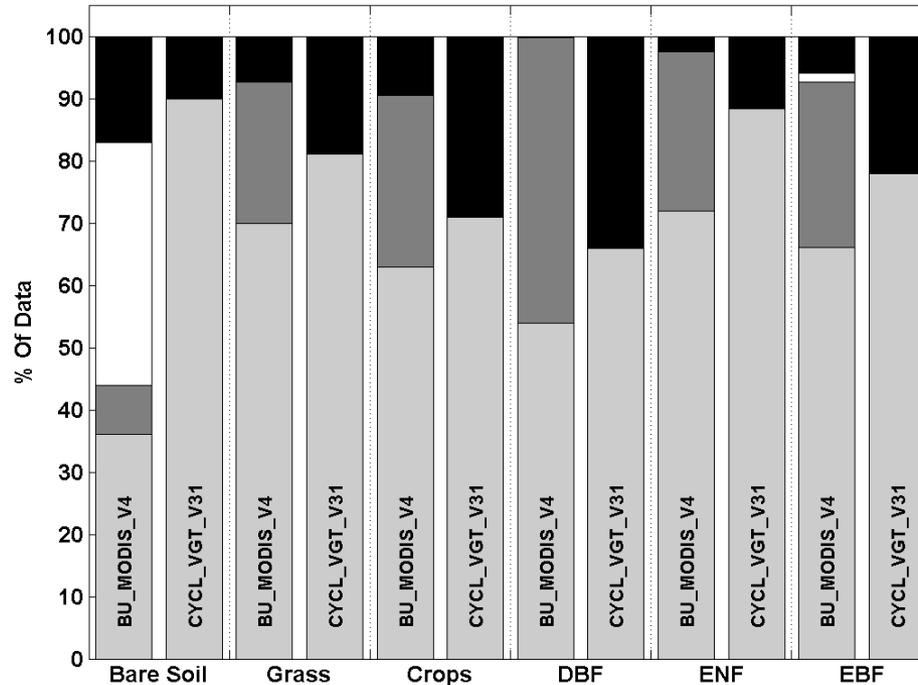
397 sites representing the variability over surface types and latitudes



Baret, F. et al., 2006. Evaluation of the representativeness of networks of sites for the global validation and inter-comparison of land biophysical products. Proposition of the CEOS-BELMANIP. IEEE Transactions on Geoscience and Remote Sensing, 44(7: special issue on global land product validation): 1794-1803.

Temporal continuity

- Original projection
- Original spatial resolution
- Original temporal sampling



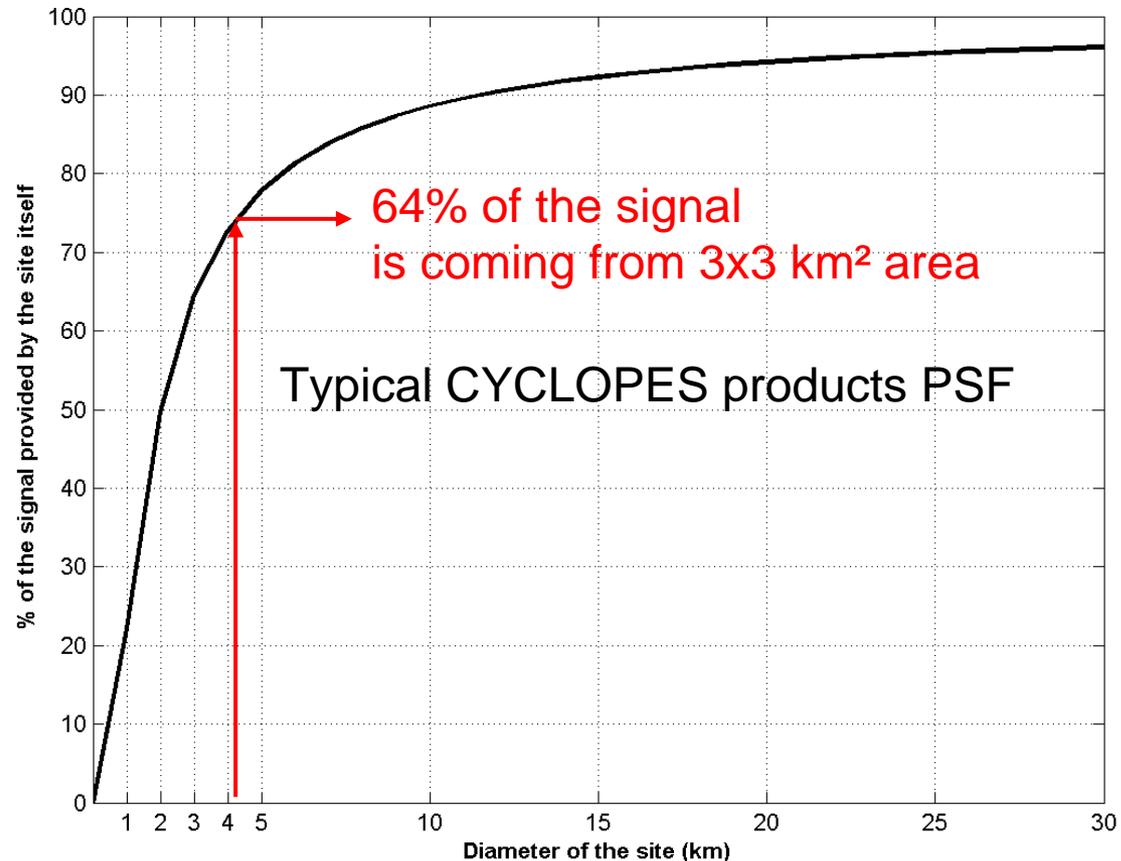
Temporal consistency

- Same projection
- Same spatial support (PSF, ...)
 - Size?
 - Projection system?
- Original temporal sampling

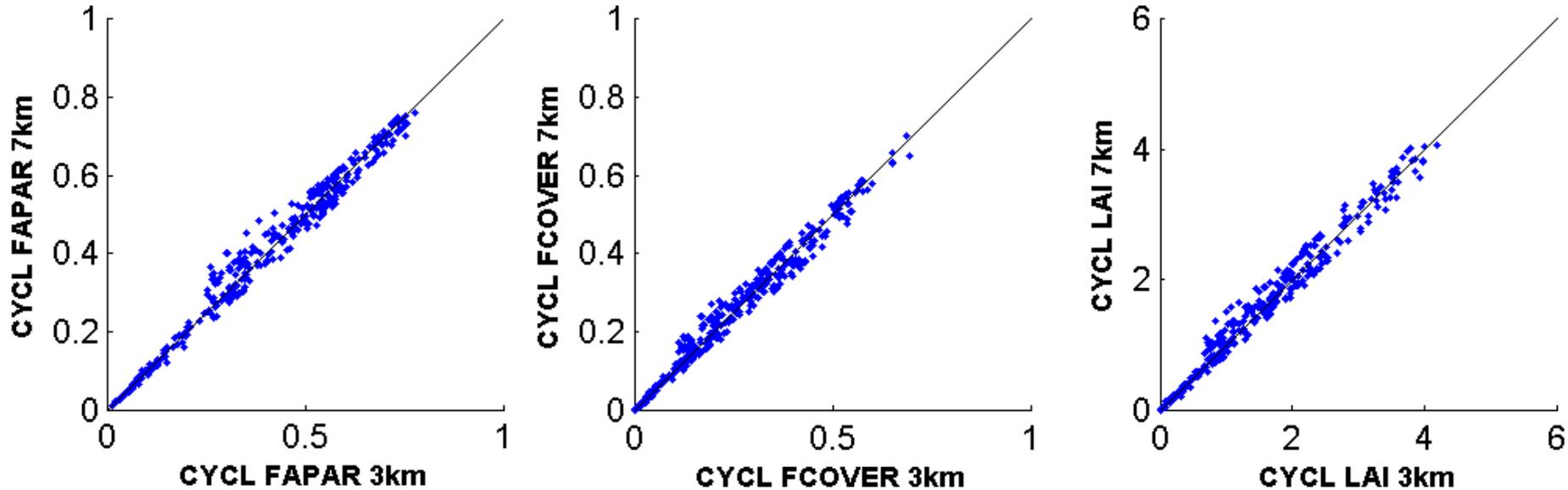
Size of the support and PSF

Point spread function depends on:

- sensor
- view direction
- projection
- atmosphere
- geometric uncertainties



Effect of the size of the sites

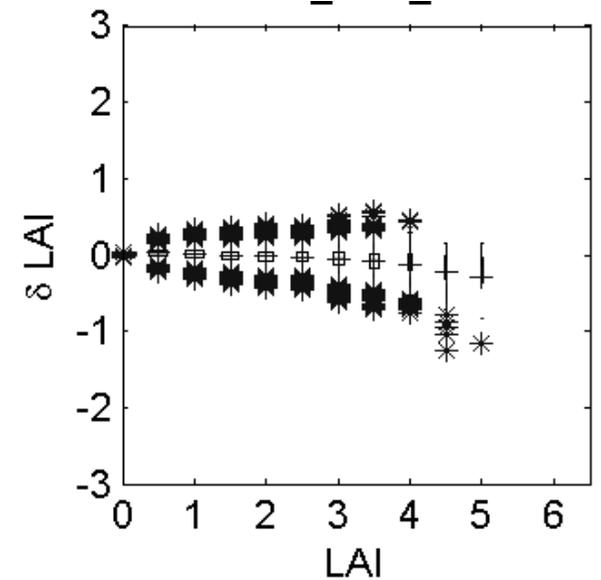
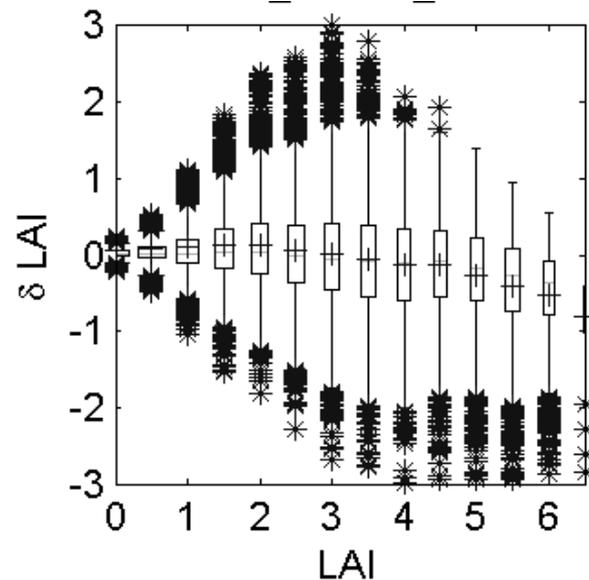
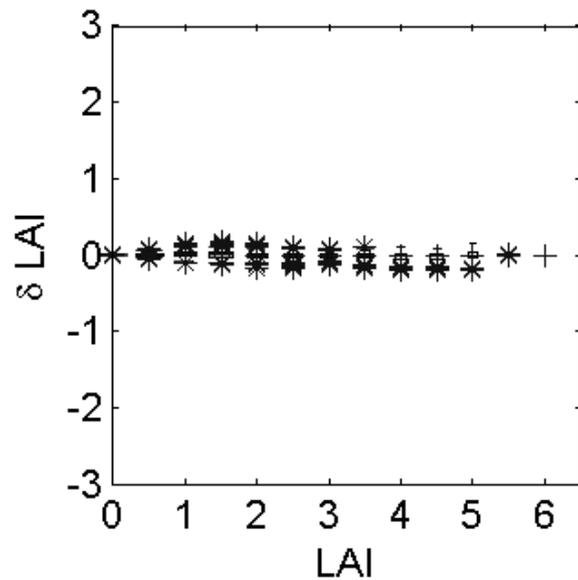
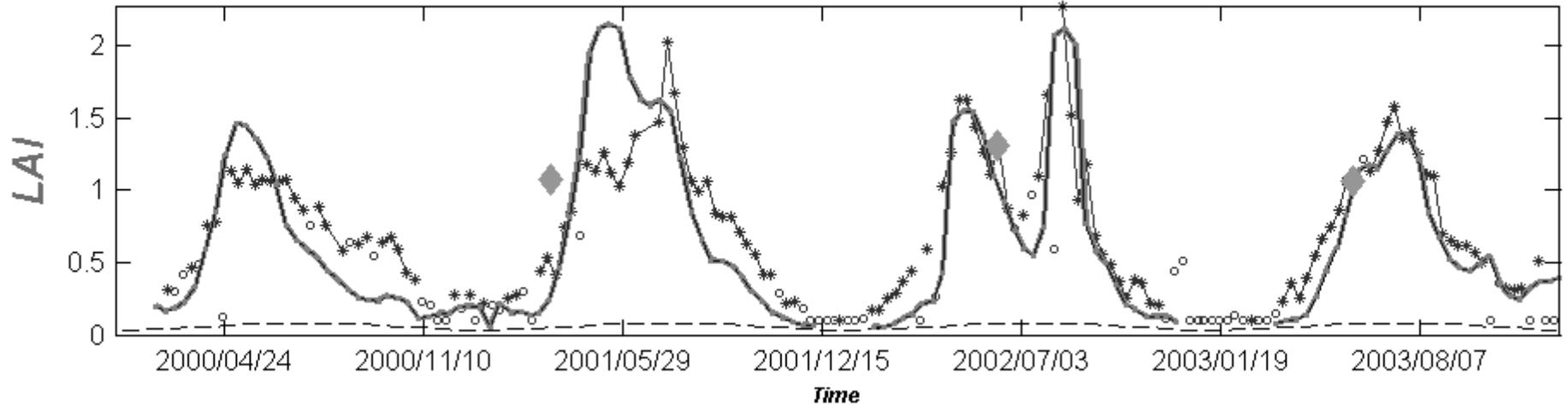


Comparison between the LAI, fCover and fAPAR CYCLOPES products averaged over 3*3 and 7*7 km².

**Apparently marginal effect of the size of the site
(effect of PSF and spatial correlations)**

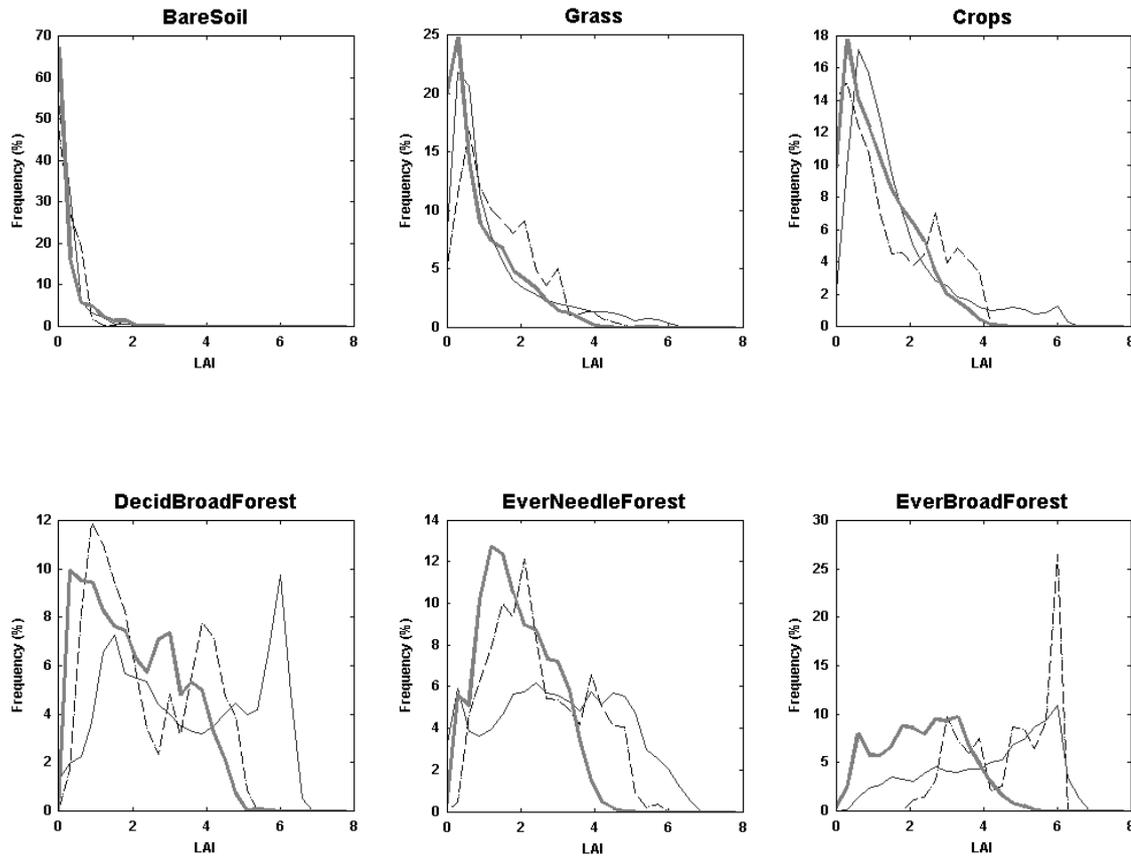
Temporal consistency: sample results

FUNDULEA (lat 44.41, lon 26.58, Crops)



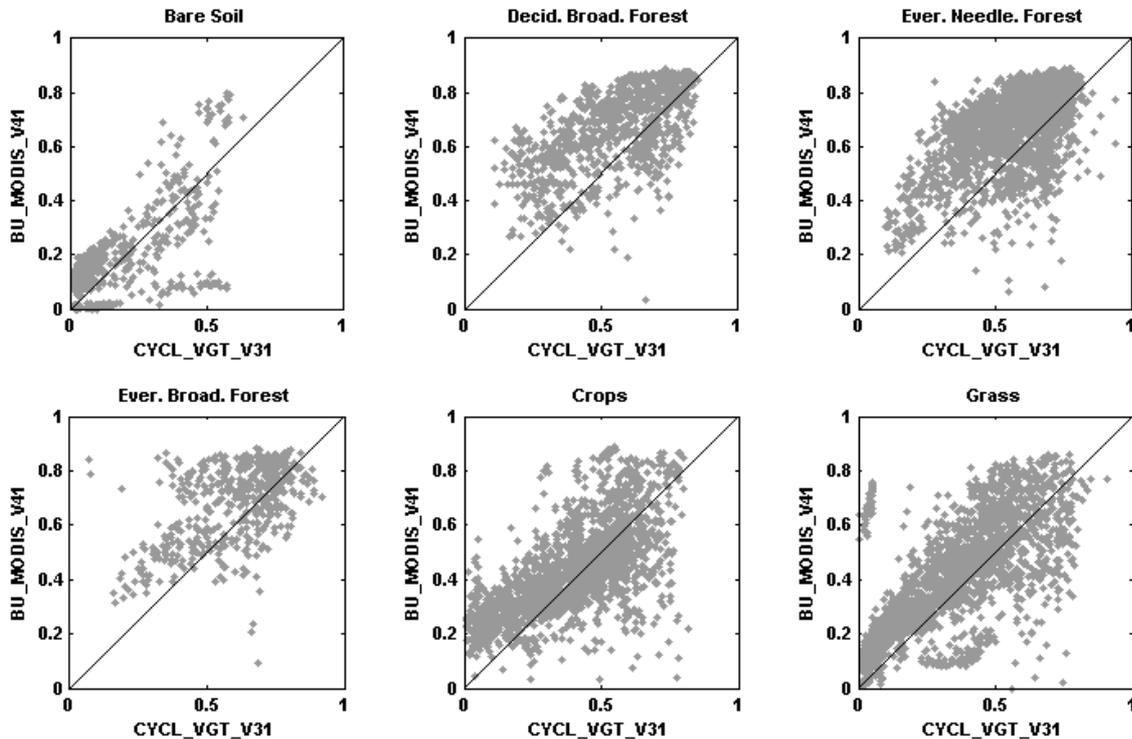
Statistical distributions

- need similar spatial support
- Projection system that keeps the area about equal
- Original temporal sampling
- Per surface type (at least!)

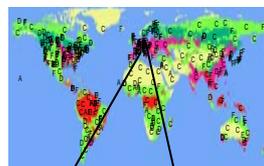


Scatterplots

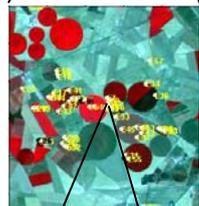
- need same spatial support
- Need concomitancy of products
 - Interpolation at the lowest temporal frequency
- Per surface type (at least!)



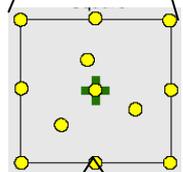
Direct validation: comparison with ground measurements: bottom-up approach



50-100 sites



20-100 ESUs/site



10-100 measurements/ESU



Global validation



Scatter plot

Medium resolution products to be validated

Value(s) at the site level



Transfer function

High spatial resolution image (SPOT/TM/ASTER ...)

Value at the ESU level



Averaging

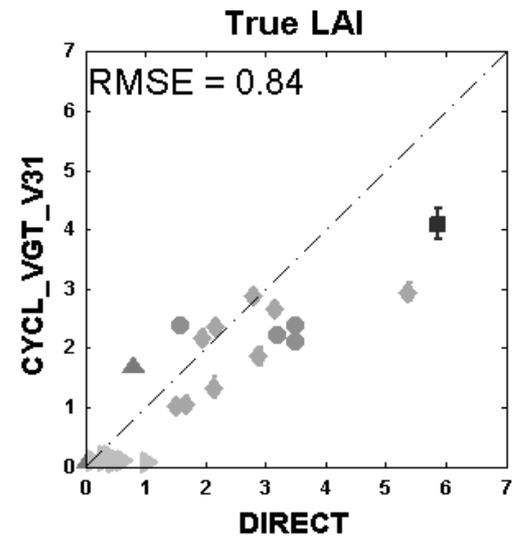
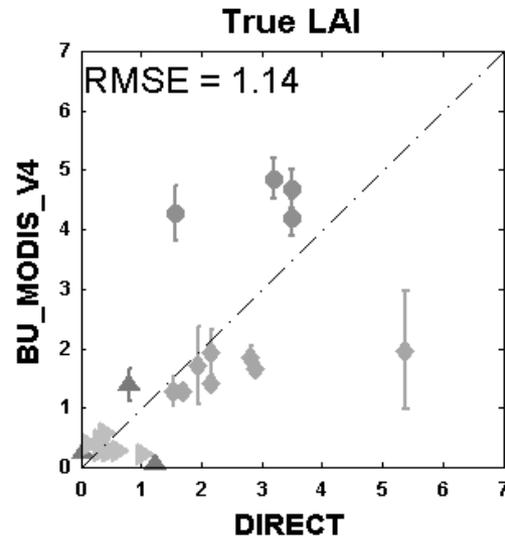
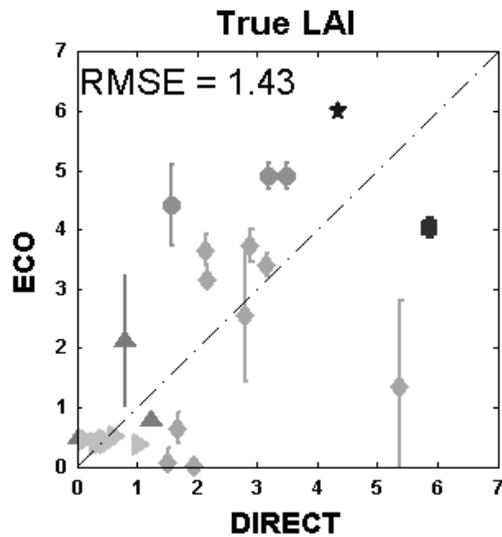
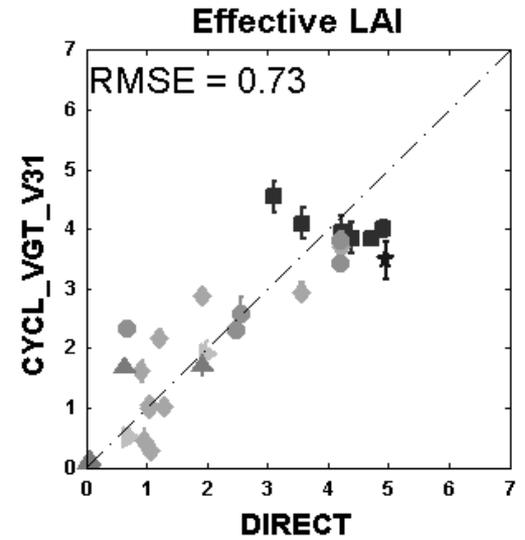
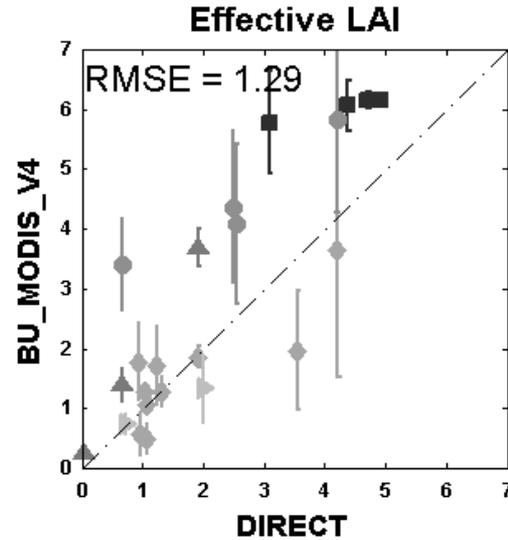
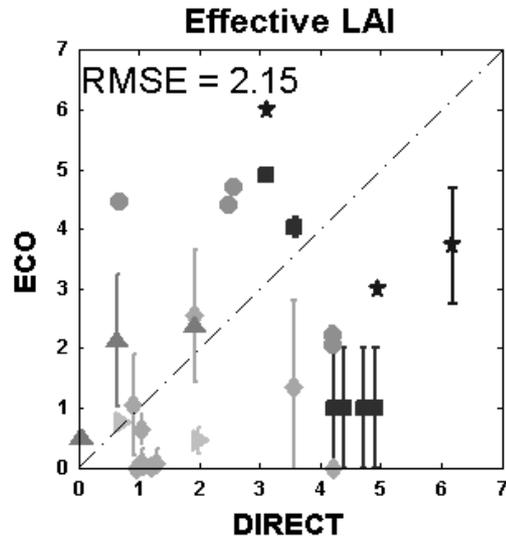
Individual measurements



Direct Validation

- Spatial support: size of validation sites
- Projection: keep the area constant
 - MODIS sinusoidal projection
- Temporal interpolation at the date of ground measurements
- Account for actual product definition (effective, true)

Sample results



Conclusion

- A methodology is proposed for the validation
- Need for better BELMANIP sites (ongoing activity)
- Need for easy to use extracts (ASCII subsets)
- Need better information on product PSF
- Projection systems to be carefully selected
- Problem of the quality flags (projection) and criteria for selection
- Consistency between products:
 - temporal sampling: better consensus?
 - Grid, datum and projection system
 - Format
 - Product definition
- Availability of sites information and documentation