Supporting information for Sun-induced Fluorescence and Near Infrared Reflectance of vegetation track the seasonal dynamics of gross primary production over Africa

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S1 Supplementary Tables and figures

Table S1. Correlations of NIRv and EC-GPP for tropical evergreen broadleaf forest site (GH-Ank).

Correlation	Spatial res.	Temporal res.	vegetation masking	IAV included	Ref
R = -0.44	$4^\circ \times 4^\circ$	monthly	yes	climatology	Fig. 2
R = 0.02	$0.5^\circ \times 0.5^\circ$	daily	No	IAV included	Fig. 3
R = 0.28	$0.05^\circ \times 0.05^\circ$	daily	No	IAV included	Fig. 3
R = 0.21	$4^\circ \times 4^\circ$	monthly	yes	IAV included	Fig. S1

Table S2. Linear regression results for NIRv and SIF with MPI-BGC GPP over major biomes of Africa temporally averaged for the years (2007 - 2011). y is the GPP inferred from NIRv/SIF and x is the NIRv/SIF signal. R is the spatial correlation coefficient between these signals and MPI-BGC GPP.

Biome	MPI-BGC GPP ($\frac{kg\ C}{m^2 yr}$) & NIRv		MPI-BGC GPP & SIF ($\frac{m\ W}{srm^2\ nm}$)		Number of data points
	fitting equation	R^2	fitting equation	R^2	
Broad leaf evergreen Forest	y = 9.06*x + 0.51	0.38	y = 1.07*x +1.58	0.16	574
C3 grass	y = 10.33*x - 0.24	0.86	y = 1.92*x + 0.10	0.77	480
Shrub Northern Africa	y = 10.97*x - 0.41	0.98	y = 1.91*x - 0.03	0.92	265
Shrub Southern Africa	y = 13.55*x - 0.62	0.96	y = 2.51*x - 0.10	0.83	325
C4 grass Northern Africa	y = 12.54*x - 0.73	0.88	y = 2.23*x - 0.54	0.86	1382
C4 grass Southern Africa	y = 13.79*x - 0.75	0.85	y = 2.55*x - 0.38	0.83	1108

Table S3. comparison of biome specific estimates of five years mean GPP covering the period from 2007 to 2011 for major biomes of Africa as derived from: linear regression of SIF/NIRv-vs-EC-GPP and Max-Planck Ensemble GPP (MPI-GPP).

	BLEF	Shrub NH	Shrub SH	C3 grass	C4 grass NH	C4 grass SH
SIF-GPP ($kg\ Cm^{-2}yr^{-1}$)	2.52	1.34	0.90	1.15	1.04	0.82
NIRv-GPP ($kg\ Cm^{-2}yr^{-1}$)	2.53	1.81	0.3	1.18	1.33	1.26
MPI-GPP ($kg\ Cm^{-2}yr^{-1}$)	2.44	1.24	1.19	1.10	1.01	1.15

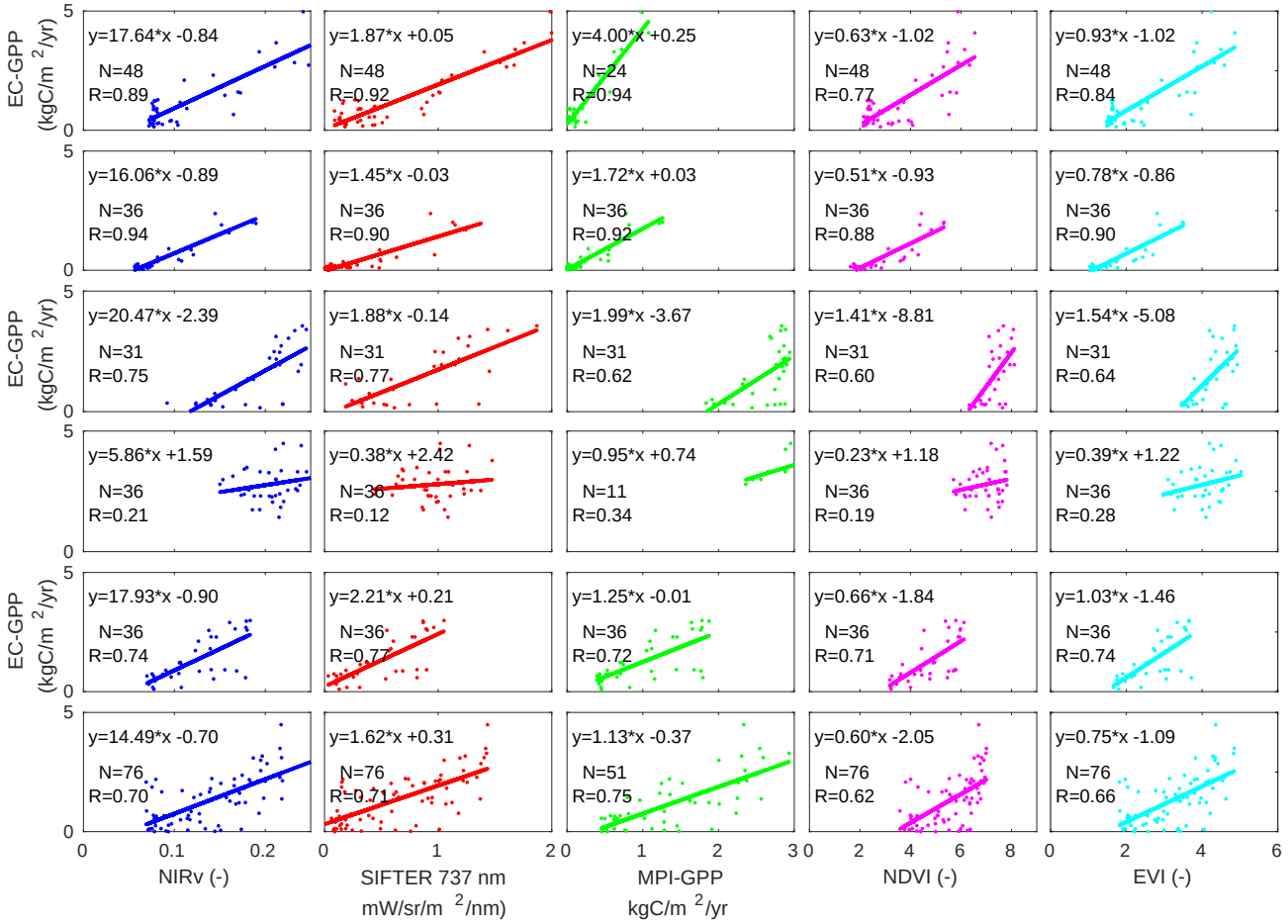

Figure S1. Comparison of eddy covariance GPP with NIRv, SIF, MPI-BGC GPP, NDVI and EVI for major biomes around the flux-tower. To obtain sufficient data the comparison is made by averaging monthly values within a $4^\circ \times 4^\circ$ window enclosing the tower. Furthermore, to account for vegetation heterogeneity of the land, grid cells with a different vegetation type than for the tower location were masked.

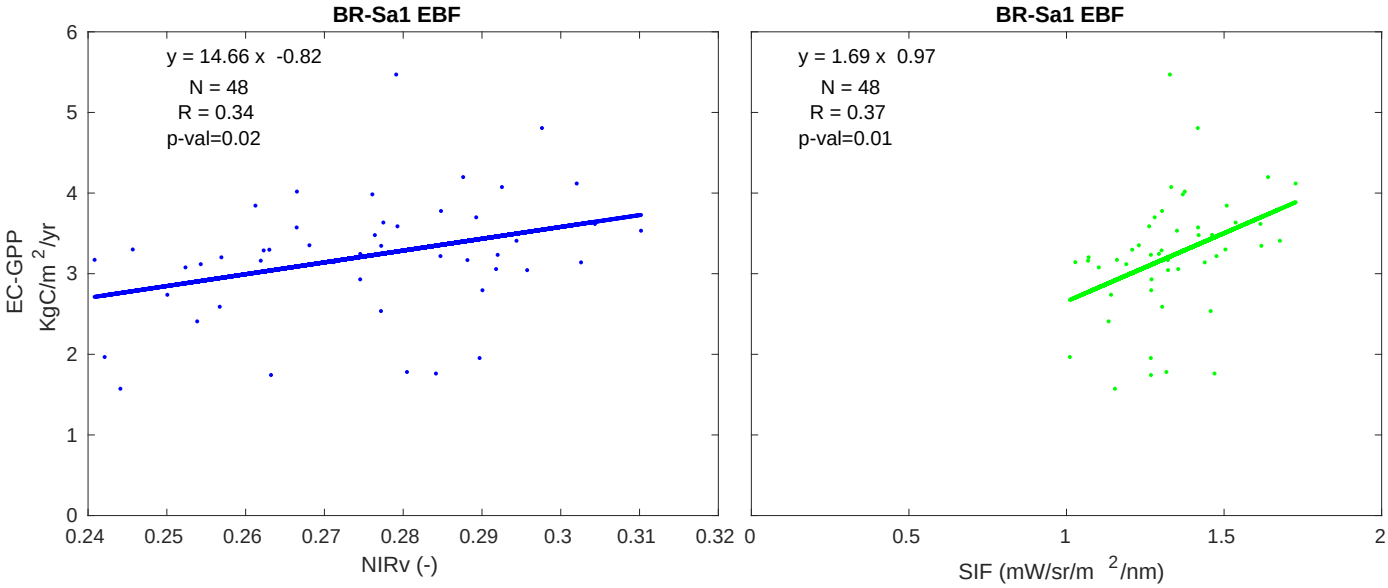

Figure S2. Comparison of eddy covariance GPP with NIRv and SIF around the Brazil BR-Sa1 flux tower. To obtain sufficient data the comparison is made by averaging monthly values within a $4^\circ \times 4^\circ$ window enclosing the tower. Furthermore, to account for vegetation heterogeneity of the land, grid cells with a different vegetation type than for the tower location (evergreen broad-leaf forest) were masked. The regression slope and intercepts are used to infer GPP from NIRv and SIF over African broad-leaf evergreen forest.

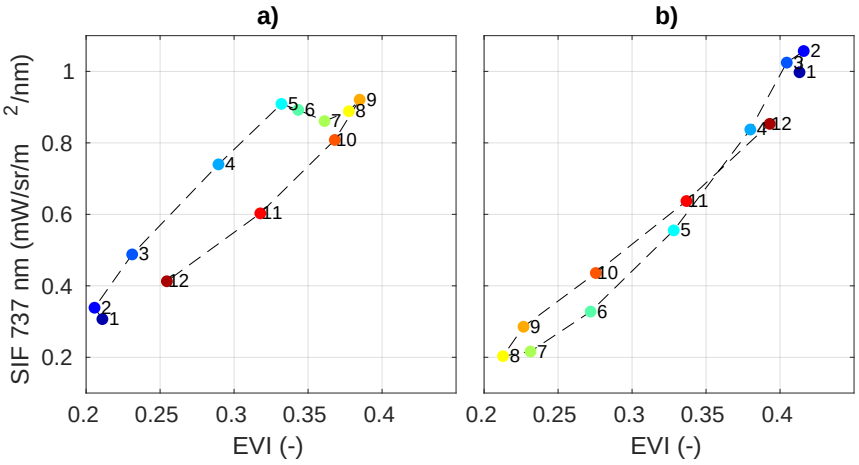

Figure S3. Seasonal values SIF verses EVI as a response of C3 grass and shrub vegetation types of Africa a) North of the equator and b) South of the equator.