Use side-view HSI data to predict biomass

2023-08-08

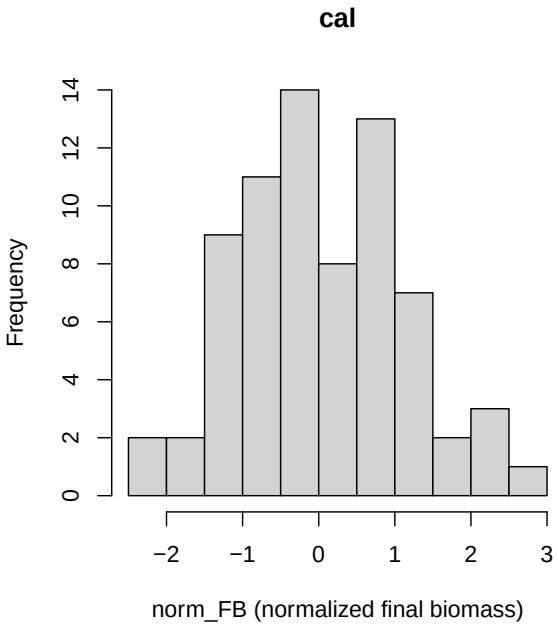
```
## $plsralg
## [1] "oscorespls"
```

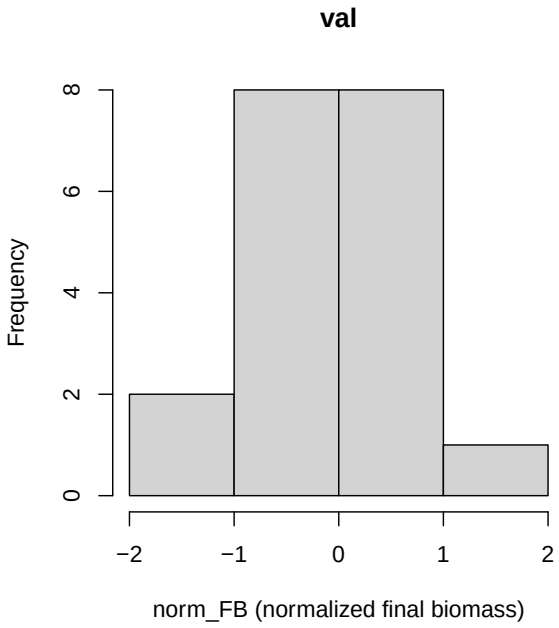
```
## 'data.frame':    94 obs. of  4 variables:
##  $ ID       : Factor w/ 94 levels "902","903","904",..: 2 10 13 14 16 18 19 20 21 24 ...
##  $ norm_FB  : num  -0.2176 -1.522 -0.1007 -0.4659 -0.0753 ...
##  $ Treatment: chr  "N1" "N1" "N1" "N1" ...
##  $ Subpop   : chr  "TRJ" "IND" "TRJ" "TRJ" ...
##  - attr(*, "na.action")= 'omit' Named int [1:282] 1 2 3 4 5 6 7 8 9 10 ...
##   ..- attr(*, "names")= chr [1:282] "1" "2" "3" "4" ...
```

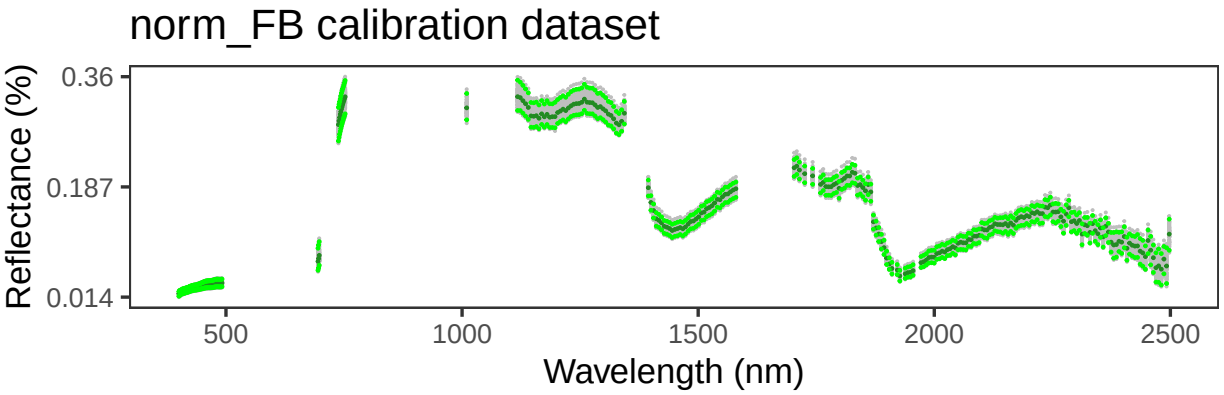
```
##  [1] "926" "924" "920" "947" "928" "905" "916" "939" "919" "921" "941" "931"
## [13] "915" "912" "945" "938" "933" "935" "925" "907" "936" "932" "903" "909"
## [25] "922" "942" "910" "946" "911" "906" "917" "944" "923" "948" "940" "937"
## [37] "975" "966" "996" "986" "974" "988" "953" "981" "993" "950" "959" "968"
## [49] "955" "976" "992" "965" "952" "964" "977" "967" "983" "989" "951" "958"
## [61] "954" "963" "995" "971" "979" "957" "960" "970" "962" "980" "984" "973"
```

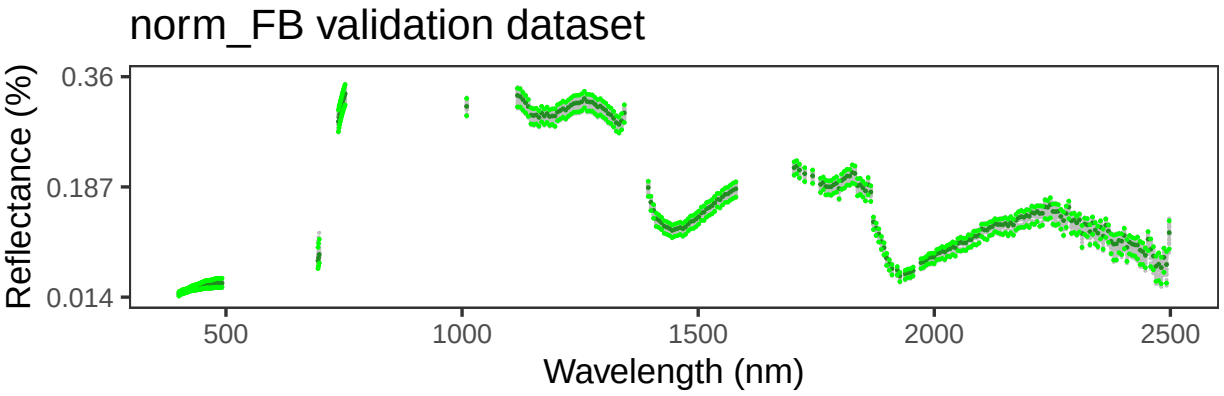
```
##  [1] "914" "934" "943" "956" "972" "978" "985" "902" "908" "913" "918" "927"
## [13] "930" "961" "969" "982" "987" "991" "994"
```

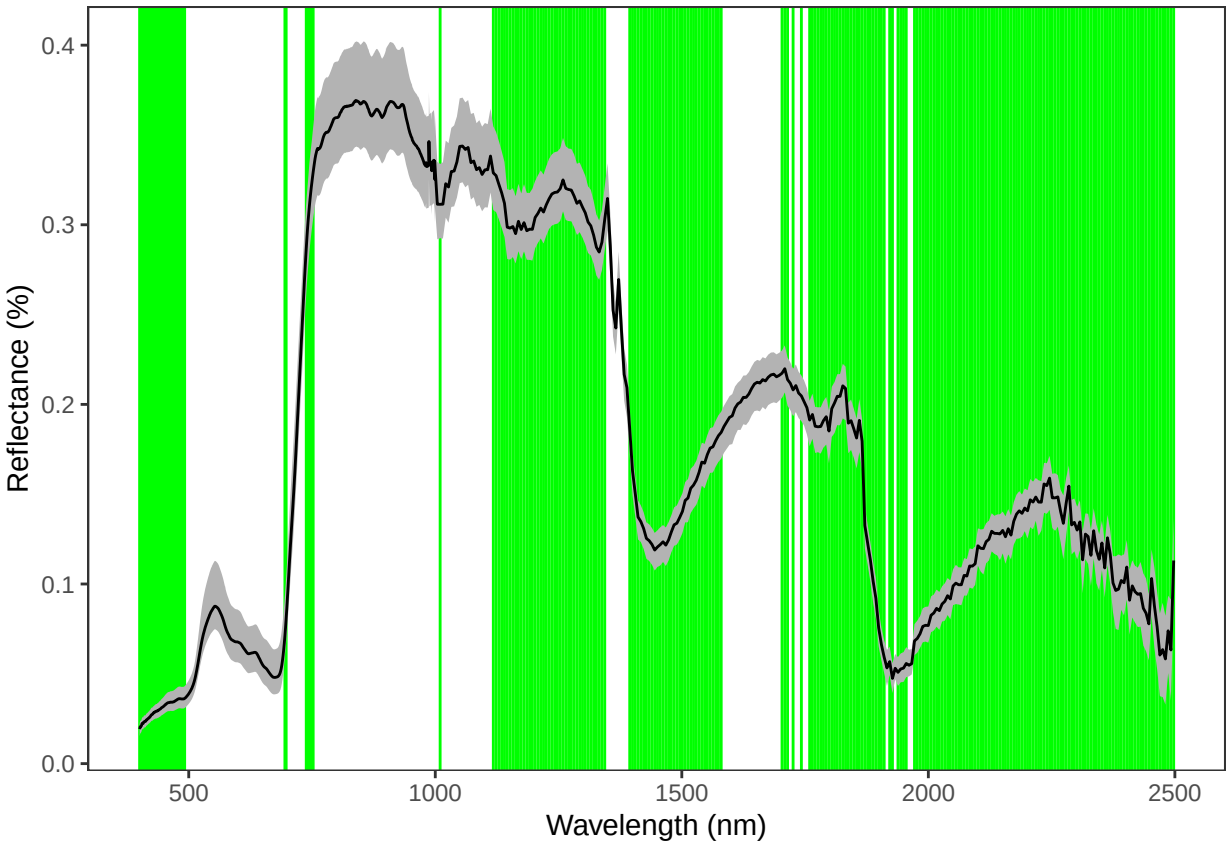
```
##          value        wv
## 612 0.03087324 1759.2800
## 284 0.03057995  752.3405
## 76  0.03045493  491.6785
## 479 0.02995800 1009.8400
## 606 0.02992083 1725.6700
## 239 0.02983373  695.0129
```

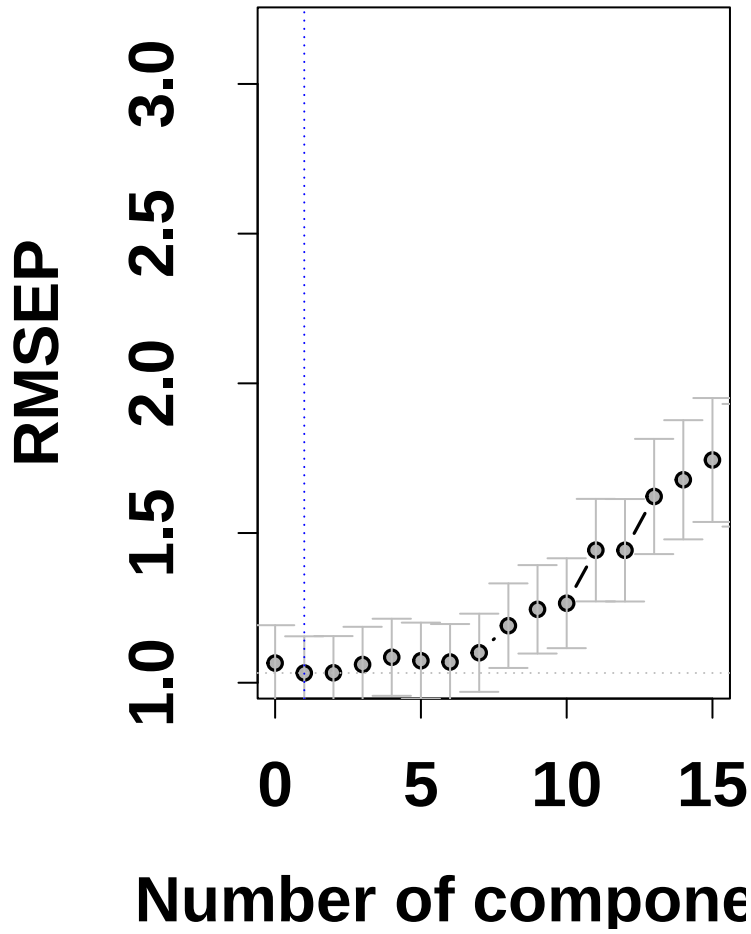

cal
Frequency
0
2
4
6
8
10
12
14
−2
−1
0
1
2
3
norm_FB (normalized final biomass)


val
Frequency
0
2
4
6
8
−2
−1
0
1
2
norm_FB (normalized final biomass)


norm_FB calibration dataset
Reflectance (%)
0.36
0.187
0.014
500
1000
1500
2000
2500
Wavelength (nm)

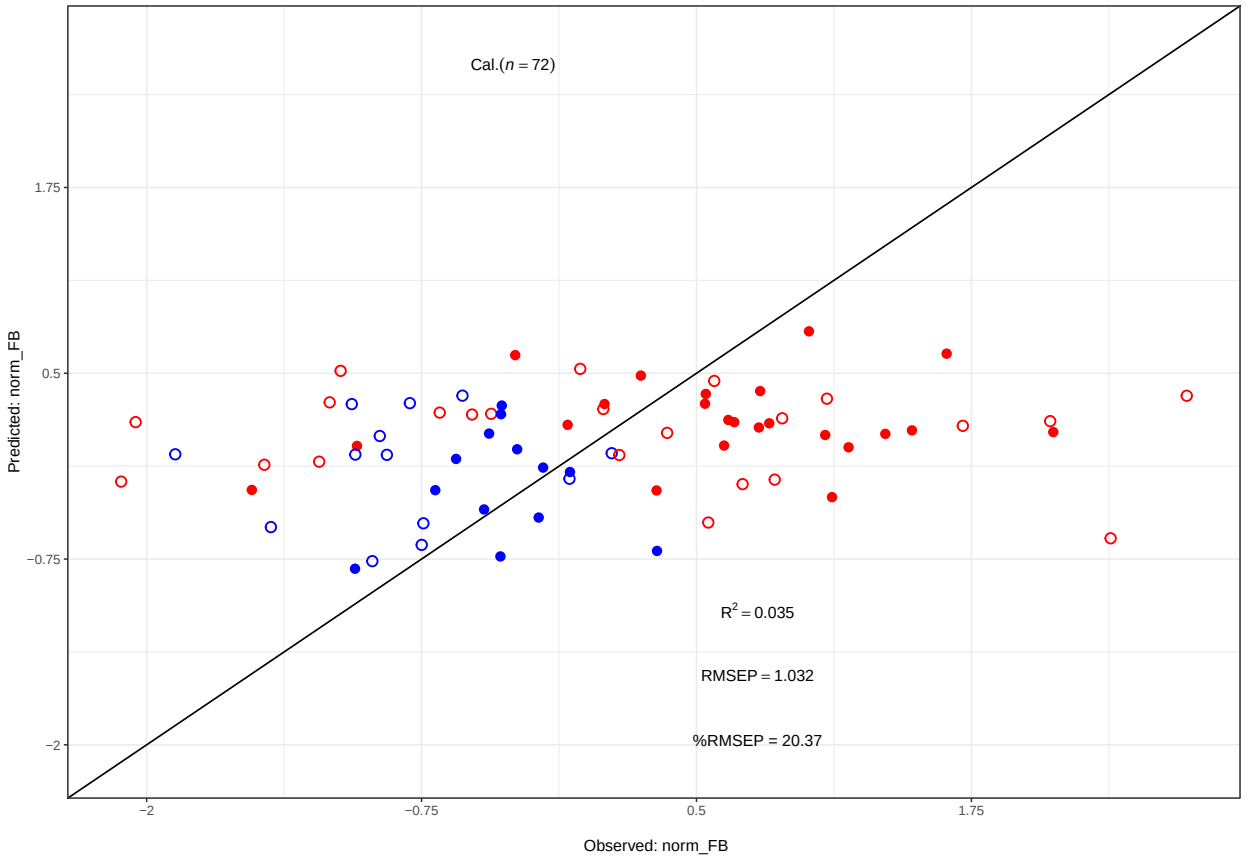

norm_FB validation dataset
Reflectance (%)
0.36
0.187
0.014
500
1000
1500
2000
2500
Wavelength (nm)

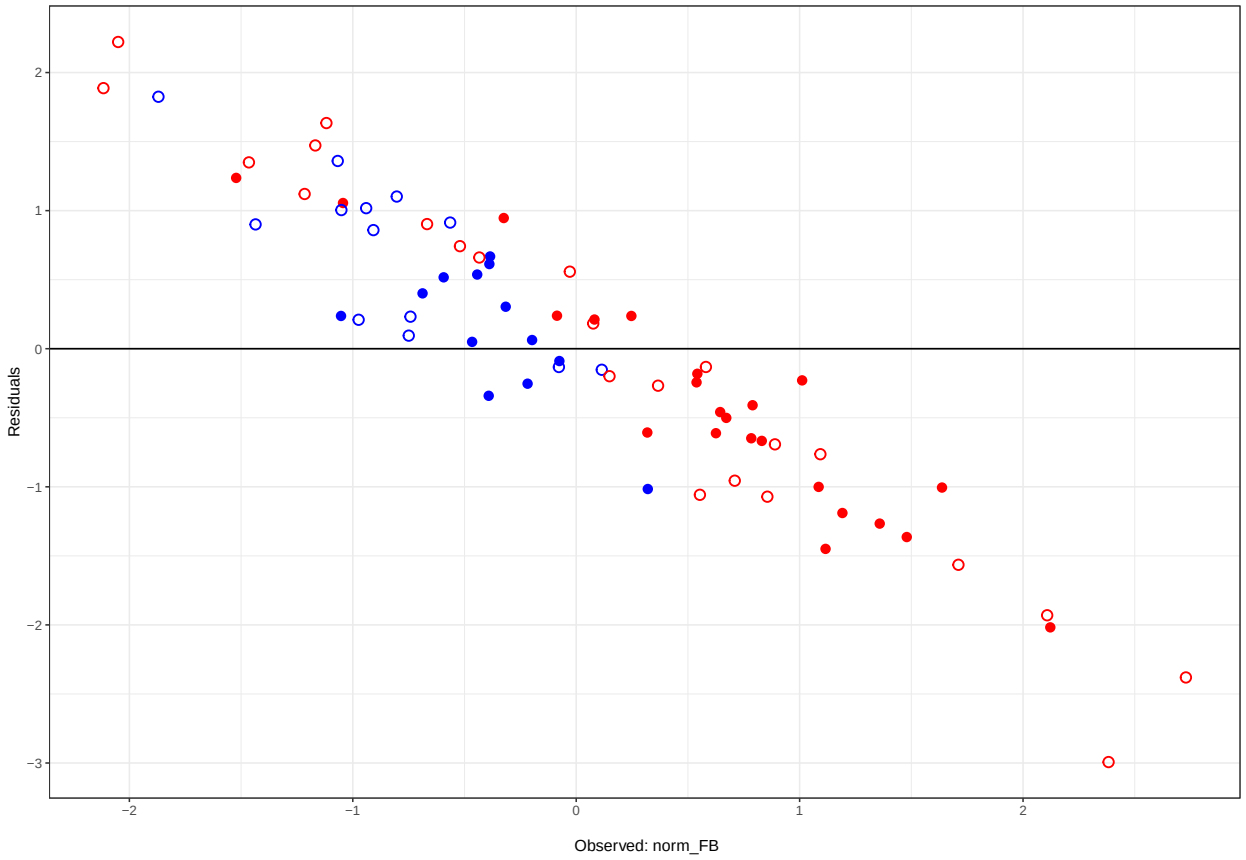

0.4
0.3
0.2
0.1
0.0
Reflectance (%)
500
1000
1500
2000
2500
Wavelength (nm)

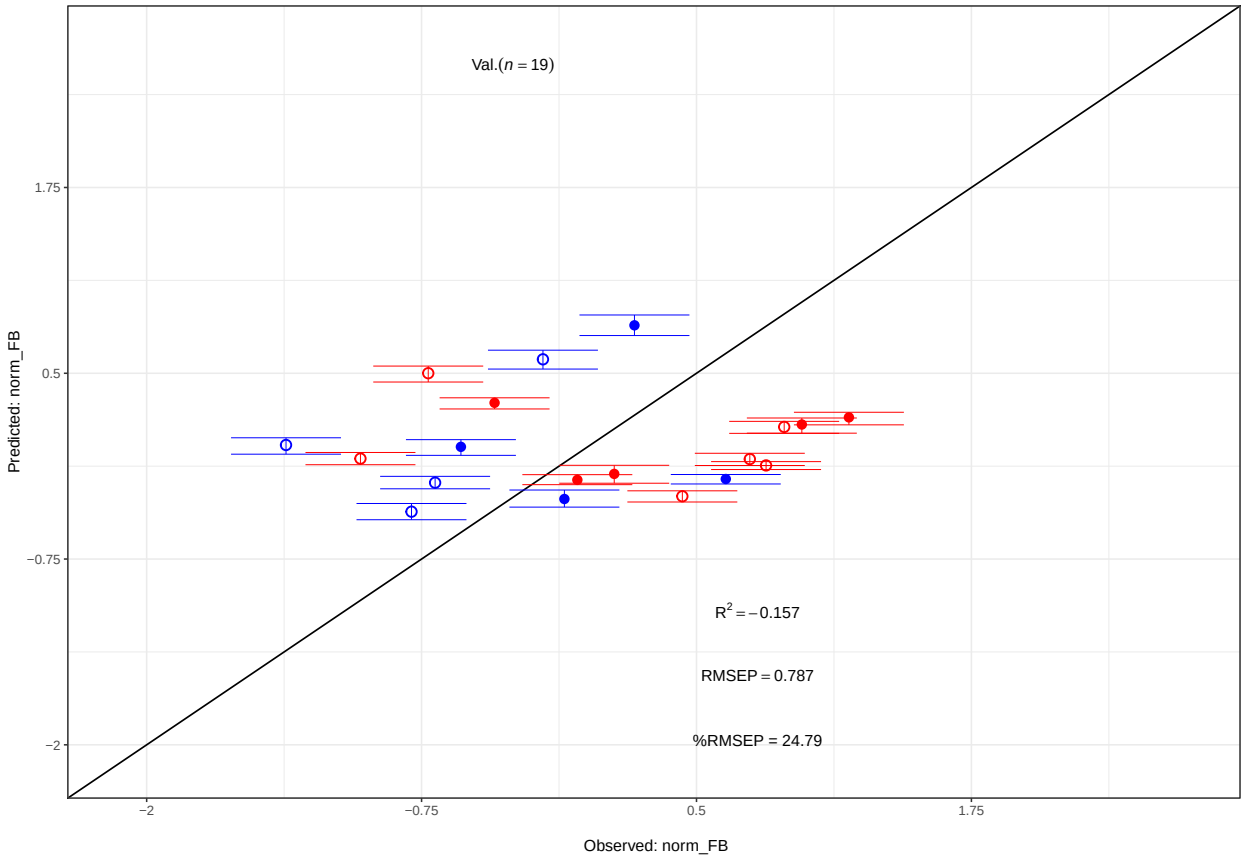


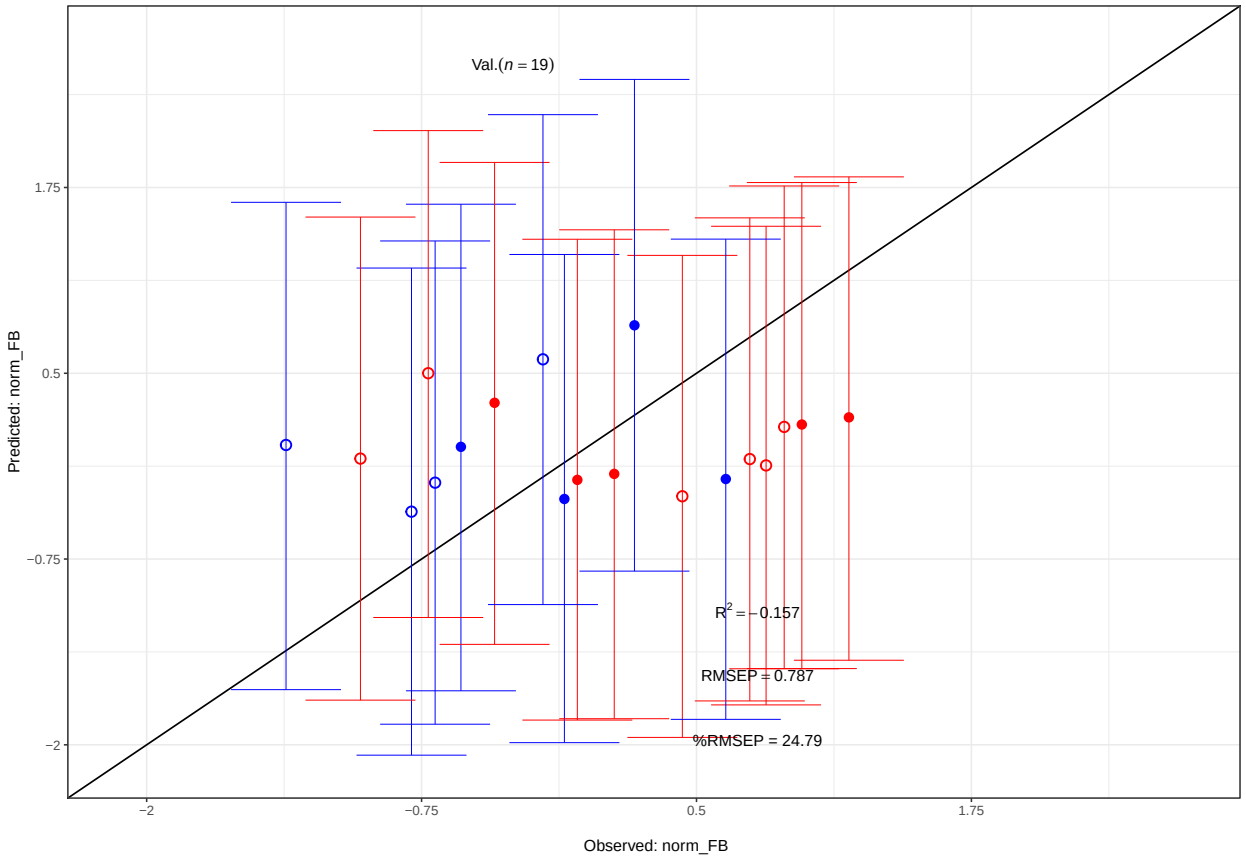

```
##   data_set     R2 RMSEP NRMSEP
## 1      cal  0.035 1.032 21.310
## 2      val -0.157 0.787 30.734
```

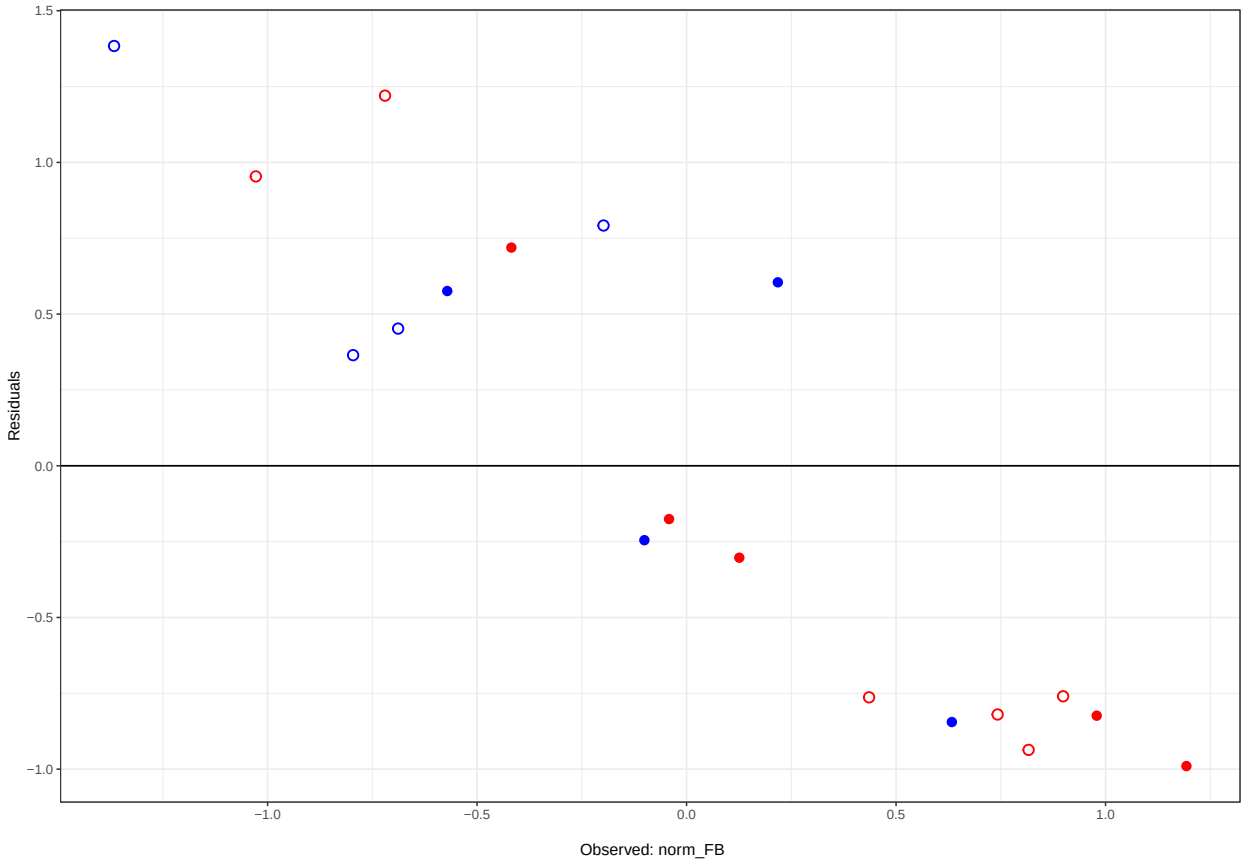
```
##     Observed   Predicted  Residuals Treatment Subpop         uci         lci
## 1 -0.1006721 -0.34594480 -0.2452727        N1    TRJ -0.28557514 -0.40060880
## 2  0.1259115 -0.17709462 -0.3030061        N1    IND -0.11924974 -0.23987321
## 3 -0.5711272  0.00494213  0.5760693        N1    TRJ  0.05334343 -0.05238757
## 4  0.8163292 -0.12012510 -0.9364543        N2    IND -0.09454730 -0.14778828
## 5  0.4356247 -0.32763912 -0.7632638        N2    IND -0.29092429 -0.36614688
## 6 -0.7958716 -0.43124425  0.3646273        N2    TRJ -0.37629272 -0.48539878
##        upi       lpi
## 1 1.299240 -1.985424
## 2 1.465254 -1.824376
## 3 1.637494 -1.636538
## 4 1.489102 -1.731438
## 5 1.293057 -1.950128
## 6 1.207968 -2.069660
```


Cal.(n = 72)
1.75
0.5
−0.75
−2
Predicted: norm_FB
−2
−0.75
0.5
1.75
Observed: norm_FB
R2 = 0.035
RMSEP = 1.032
%RMSEP = 20.37


Residuals
2
1
0
−1
−2
−3
−2
−1
0
1
2
Observed: norm_FB


Val.(n = 19)
1.75
0.5
−0.75
−2
Predicted: norm_FB
−2
−0.75
0.5
1.75
Observed: norm_FB
R² = −0.157
RMSEP = 0.787
%RMSEP = 24.79


Val.(n = 19)
1.75
0.5
−0.75
−2
Predicted: norm_FB
−2
−0.75
0.5
1.75
Observed: norm_FB
R2 = −0.157
RMSEP = 0.787
%RMSEP = 24.79




```
##       Iteration  Intercept   X2257.02   X2312.93   X2251.43    X2273.8
## Seg 1         1 -0.3782167 -0.4156179 -0.4762681 -0.3964790 -0.4855236
## Seg 2         2 -0.2834606 -0.3900936 -0.4413447 -0.3723026 -0.4515870
## Seg 3         3 -0.3529065 -0.4087990 -0.4665396 -0.3889985 -0.4759544
## Seg 4         4 -0.5752990 -0.4091230 -0.4691563 -0.3895143 -0.4775806
## Seg 5         5 -0.5361383 -0.4072680 -0.4671678 -0.3880179 -0.4755666
## Seg 6         6 -0.4804127 -0.4036394 -0.4601709 -0.3836481 -0.4714104
```

```
##              coefs
## 2257.02 -0.4086225
## 2312.93 -0.4684027
## 2251.43 -0.3891932
## 2273.8  -0.4767866
## 2301.75 -0.3852310
## 2279.39 -0.4187326
```