# Model call record

## Sasha D. Hafner

Calculates emission factors

Check package version.

```
packageVersion('ALFAM2')
```

```
## [1] '1.5.1'
```

Parameter values.

```
ALFAM2pars02
```

```
##              int.f0     app.mthd.os.f0     app.rate.ni.f0           man.dm.f0
##          -0.60568338        -1.74351499        -0.01114900          0.39967070
## man.source.pig.f0     app.mthd.cs.f0             int.r1      app.mthd.bc.r1
##          -0.59202858        -7.63373787        -0.93921516          0.79352480
##            man.dm.r1        air.temp.r1          wind.2m.r1      app.mthd.ts.r1
##          -0.13988189         0.07354268         0.15026720         -0.45907135
## ts.cereal.hght.r1           man.ph.r1             int.r2         rain.rate.r2
##          -0.24471238         0.66500000        -1.79918546          0.39402156
##               int.r3     app.mthd.bc.r3     app.mthd.cs.r3           man.ph.r3
##          -3.22841225         0.56153956        -0.66647417          0.23800000
## incorp.shallow.f4 incorp.shallow.r3      incorp.deep.f4      incorp.deep.r3
##          -0.96496655        -0.58052689        -3.69494954         -1.26569562
```

```
dat
```

```
##    app.timing.dk app.timing  air.temp  wind.2m  rain.rate                app.mthd
## 1          Marts      March  4.431012 4.058916 0.05996290            Trailing hose
## 2          April      April  8.236460 3.844456 0.05521194            Trailing hose
## 3            Maj        May 12.449250 3.483915 0.07029935            Trailing hose
## 4         Sommer     Summer 16.876226 3.156240 0.10592531            Trailing hose
```

```
## 5       Efterår      Autumn 14.497748 3.322770 0.12826017         Trailing hose
## 6        Marts        March  4.431012 4.058916 0.05996290    Open slot injection
## 7        April        April  8.236460 3.844456 0.05521194    Open slot injection
## 8          Maj          May 12.449250 3.483915 0.07029935    Open slot injection
## 9       Sommer       Summer 16.876226 3.156240 0.10592531    Open slot injection
## 10      Efterår      Autumn 14.497748 3.322770 0.12826017    Open slot injection
## 11        Marts        March  4.431012 4.058916 0.05996290 Closed slot injection
## 12        April        April  8.236460 3.844456 0.05521194 Closed slot injection
## 13          Maj          May 12.449250 3.483915 0.07029935 Closed slot injection
## 14       Sommer       Summer 16.876226 3.156240 0.10592531 Closed slot injection
## 15      Efterår      Autumn 14.497748 3.322770 0.12826017 Closed slot injection
## 16        Marts        March  4.431012 4.058916 0.05996290         Trailing hose
## 17        April        April  8.236460 3.844456 0.05521194         Trailing hose
## 18          Maj          May 12.449250 3.483915 0.07029935         Trailing hose
## 19       Sommer       Summer 16.876226 3.156240 0.10592531         Trailing hose
## 20      Efterår      Autumn 14.497748 3.322770 0.12826017         Trailing hose
## 21        Marts        March  4.431012 4.058916 0.05996290         Trailing hose
## 22        April        April  8.236460 3.844456 0.05521194         Trailing hose
## 23          Maj          May 12.449250 3.483915 0.07029935         Trailing hose
## 24       Sommer       Summer 16.876226 3.156240 0.10592531         Trailing hose
## 25      Efterår      Autumn 14.497748 3.322770 0.12826017         Trailing hose
## 26        Marts        March  4.431012 4.058916 0.05996290         Trailing hose
## 27        April        April  8.236460 3.844456 0.05521194         Trailing hose
## 28          Maj          May 12.449250 3.483915 0.07029935         Trailing hose
## 29       Sommer       Summer 16.876226 3.156240 0.10592531         Trailing hose
## 30      Efterår      Autumn 14.497748 3.322770 0.12826017         Trailing hose
## 31        Marts        March  4.431012 4.058916 0.05996290         Trailing hose
## 32        April        April  8.236460 3.844456 0.05521194         Trailing hose
## 33          Maj          May 12.449250 3.483915 0.07029935         Trailing hose
## 34       Sommer       Summer 16.876226 3.156240 0.10592531         Trailing hose
## 35      Efterår      Autumn 14.497748 3.322770 0.12826017         Trailing hose
## 36        Marts        March  4.431012 4.058916 0.05996290    Open slot injection
## 37        April        April  8.236460 3.844456 0.05521194    Open slot injection
## 38          Maj          May 12.449250 3.483915 0.07029935    Open slot injection
## 39       Sommer       Summer 16.876226 3.156240 0.10592531    Open slot injection
## 40      Efterår      Autumn 14.497748 3.322770 0.12826017    Open slot injection
## 41        Marts        March  4.431012 4.058916 0.05996290 Closed slot injection
## 42        April        April  8.236460 3.844456 0.05521194 Closed slot injection
## 43          Maj          May 12.449250 3.483915 0.07029935 Closed slot injection
```

```
## 44          Sommer     Summer 16.876226 3.156240 0.10592531 Closed slot injection
## 45          Efterår    Autumn 14.497748 3.322770 0.12826017 Closed slot injection
## 46          Marts       March  4.431012 4.058916 0.05996290          Trailing hose
## 47          April       April  8.236460 3.844456 0.05521194          Trailing hose
## 48          Maj           May 12.449250 3.483915 0.07029935          Trailing hose
## 49          Sommer     Summer 16.876226 3.156240 0.10592531          Trailing hose
## 50          Efterår    Autumn 14.497748 3.322770 0.12826017          Trailing hose
## 51          Marts       March  4.431012 4.058916 0.05996290          Trailing hose
## 52          April       April  8.236460 3.844456 0.05521194          Trailing hose
## 53          Maj           May 12.449250 3.483915 0.07029935          Trailing hose
## 54          Sommer     Summer 16.876226 3.156240 0.10592531          Trailing hose
## 55          Efterår    Autumn 14.497748 3.322770 0.12826017          Trailing hose
## 56          Marts       March  4.431012 4.058916 0.05996290          Trailing hose
## 57          April       April  8.236460 3.844456 0.05521194          Trailing hose
## 58          Maj           May 12.449250 3.483915 0.07029935          Trailing hose
## 59          Sommer     Summer 16.876226 3.156240 0.10592531          Trailing hose
## 60          Efterår    Autumn 14.497748 3.322770 0.12826017          Trailing hose
##    app.rate.ni        man.source   acid man.dm man.ph  ct tan.app id
## 1           30 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  1
## 2           30 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  2
## 3           30 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  3
## 4           30 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  4
## 5           30 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  5
## 6            0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  6
## 7            0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  7
## 8            0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  8
## 9            0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100  9
## 10           0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100 10
## 11           0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100 11
## 12           0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100 12
## 13           0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100 13
## 14           0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100 14
## 15           0 Afgasset biomasse     0 kg/t    5.1 7.9000 168     100 15
## 16          30 Afgasset biomasse    11 kg/t    5.1 6.5200 168     100 16
## 17          30 Afgasset biomasse    11 kg/t    5.1 6.5200 168     100 17
## 18          30 Afgasset biomasse    11 kg/t    5.1 6.5200 168     100 18
## 19          30 Afgasset biomasse    11 kg/t    5.1 6.5200 168     100 19
## 20          30 Afgasset biomasse    11 kg/t    5.1 6.5200 168     100 20
## 21          30 Afgasset biomasse 3.4 kg/t    5.1 7.0813 168     100 21
```

```
## 22          30 Afgasset biomasse 3.4 kg/t     5.1 7.0813 168         100 22
## 23          30 Afgasset biomasse 3.4 kg/t     5.1 7.0813 168         100 23
## 24          30 Afgasset biomasse 3.4 kg/t     5.1 7.0813 168         100 24
## 25          30 Afgasset biomasse 3.4 kg/t     5.1 7.0813 168         100 25
## 26          30 Afgasset biomasse 7.5 kg/t     5.1 6.7900 168         100 26
## 27          30 Afgasset biomasse 7.5 kg/t     5.1 6.7900 168         100 27
## 28          30 Afgasset biomasse 7.5 kg/t     5.1 6.7900 168         100 28
## 29          30 Afgasset biomasse 7.5 kg/t     5.1 6.7900 168         100 29
## 30          30 Afgasset biomasse 7.5 kg/t     5.1 6.7900 168         100 30
## 31          30 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 31
## 32          30 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 32
## 33          30 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 33
## 34          30 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 34
## 35          30 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 35
## 36           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 36
## 37           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 37
## 38           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 38
## 39           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 39
## 40           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 40
## 41           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 41
## 42           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 42
## 43           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 43
## 44           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 44
## 45           0 Afgasset biomasse   0 kg/t     6.9 7.9000 168         100 45
## 46          30 Afgasset biomasse  11 kg/t     6.9 6.5200 168         100 46
## 47          30 Afgasset biomasse  11 kg/t     6.9 6.5200 168         100 47
## 48          30 Afgasset biomasse  11 kg/t     6.9 6.5200 168         100 48
## 49          30 Afgasset biomasse  11 kg/t     6.9 6.5200 168         100 49
## 50          30 Afgasset biomasse  11 kg/t     6.9 6.5200 168         100 50
## 51          30 Afgasset biomasse 3.4 kg/t     6.9 7.0813 168         100 51
## 52          30 Afgasset biomasse 3.4 kg/t     6.9 7.0813 168         100 52
## 53          30 Afgasset biomasse 3.4 kg/t     6.9 7.0813 168         100 53
## 54          30 Afgasset biomasse 3.4 kg/t     6.9 7.0813 168         100 54
## 55          30 Afgasset biomasse 3.4 kg/t     6.9 7.0813 168         100 55
## 56          30 Afgasset biomasse 7.5 kg/t     6.9 6.7900 168         100 56
## 57          30 Afgasset biomasse 7.5 kg/t     6.9 6.7900 168         100 57
## 58          30 Afgasset biomasse 7.5 kg/t     6.9 6.7900 168         100 58
## 59          30 Afgasset biomasse 7.5 kg/t     6.9 6.7900 168         100 59
## 60          30 Afgasset biomasse 7.5 kg/t     6.9 6.7900 168         100 60
```

Run model

With set 2 parameters

```
preds <- ALFAM2mod(dat, pars = ALFAM2pars02, app.name = 'tan.app', time.name = 'ct', group = 'id', warn = TRUE, prep = TRUE, parallel = TR
```

```
## User-supplied parameters are being used.

## Warning in ALFAM2mod(dat, pars = ALFAM2pars02, app.name = "tan.app", time.name = "ct", : Running with 15 parameters. Dropped 9 with no
## These secondary parameters have been dropped:
##    man.source.pig.f0
##    app.mthd.bc.r1
##    app.mthd.ts.r1
##    ts.cereal.hght.r1
##    app.mthd.bc.r3
##    incorp.shallow.f4
##    incorp.shallow.r3
##    incorp.deep.f4
##    incorp.deep.r3
##
## These secondary parameters are being used:
##    int.f0
##    app.mthd.os.f0
##    app.rate.ni.f0
##    man.dm.f0
##    app.mthd.cs.f0
##    int.r1
##    man.dm.r1
##    air.temp.r1
##    wind.2m.r1
##    man.ph.r1
##    int.r2
##    rain.rate.r2
##    int.r3
##    app.mthd.cs.r3
##    man.ph.r3
```

Check reference condition.

```
ALFAM2mod(ref, pars = ALFAM2pars01, app.name = 'tan.app', time.name = 'ct', time.incorp = 't.incorp', warn = TRUE)
```

```
## User-supplied parameters are being used.
```

```
## Warning in ALFAM2mod(ref, pars = ALFAM2pars01, app.name = "tan.app", time.name
## = "ct", : No matching column for incorporation parameter(s): incorp.deep,
## incorp.shallow. Skipping incorporation.

## Warning in ALFAM2mod(ref, pars = ALFAM2pars01, app.name = "tan.app", time.name = "ct", : Running with 15 parameters. Dropped 5 with no
## These secondary parameters have been dropped:
##    app.rate.f0
##    incorp.deep.f4
##    incorp.shallow.f4
##    incorp.deep.r3
##    rain.cum.r3
##
## These secondary parameters are being used:
##    int.f0
##    int.r1
##    int.r2
##    int.r3
##    app.mthd.os.f0
##    man.dm.f0
##    app.mthd.bc.r1
##    man.dm.r1
##    air.temp.r1
##    wind.2m.r1
##    man.ph.r1
##    air.temp.r3
##    app.mthd.os.r3
##    man.ph.r3
##    rain.rate.r2

##    ct  dt        f0         r1        r2         r3 f4         f        s
## 1 168 168 0.3237724 0.06628499 0.1110777 0.001255181  1 3.7119e-12 71.30525
##          j        e    e.int        er
## 1 0.1708021 28.69475 28.69475 0.2869475
```

```r
ALFAM2mod(ref, pars = ALFAM2pars02, app.name = 'tan.app', time.name = 'ct', time.incorp = 't.incorp', warn = TRUE)
```

```
## User-supplied parameters are being used.

## Warning in ALFAM2mod(ref, pars = ALFAM2pars02, app.name = "tan.app", time.name
## = "ct", : No matching column for incorporation parameter(s): incorp.shallow,
## incorp.deep. Skipping incorporation.
```

```
## Warning in ALFAM2mod(ref, pars = ALFAM2pars02, app.name = "tan.app", time.name = "ct", : Running with 20 parameters. Dropped 4 with no
## These secondary parameters have been dropped:
##   incorp.shallow.f4
##   incorp.shallow.r3
##   incorp.deep.f4
##   incorp.deep.r3
##
## These secondary parameters are being used:
##   int.f0
##   app.mthd.os.f0
##   app.rate.ni.f0
##   man.dm.f0
##   man.source.pig.f0
##   app.mthd.cs.f0
##   int.r1
##   app.mthd.bc.r1
##   man.dm.r1
##   air.temp.r1
##   wind.2m.r1
##   app.mthd.ts.r1
##   ts.cereal.hght.r1
##   man.ph.r1
##   int.r2
##   rain.rate.r2
##   int.r3
##   app.mthd.bc.r3
##   app.mthd.cs.r3
##   man.ph.r3

##   ct  dt        f0       r1         r2           r3 f4            f        s
## 1 168 168 0.2589096 0.115023 0.01587869 0.0005910004  1 7.283926e-09 69.96107
##           j        e     e.int         er
## 1 0.1788032 30.03893 30.03893 0.3003893
```

Add results to main df

```
dat$EF <- signif(preds$er, 2)
dat$EFp <- 100 * signif(preds$er, 2)
```