Model call record

Sasha D. Hafner

September 2020

Calculates emission factors

Check package version.

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

```
## [1] '1.4.1'
```

Parameter values.

```
ALFAM2pars02
```

```
##           int.f0    app.mthd.os.f0    app.rate.ni.f0         man.dm.f0 man.source.pig.f0    app.mthd.cs.f0           int.r1    app.mt
##      -0.60568338      -1.74351499      -0.01114900       0.39967070      -0.59202858      -7.63373787      -0.93921516       0.
##        man.ph.r1           int.r2     rain.rate.r2           int.r3    app.mthd.bc.r3    app.mthd.cs.r3        man.ph.r3 incorp.sh
##       0.66500000      -1.79918546       0.39402156      -3.22841225       0.56153956      -0.66647417       0.23800000       -0.
```

```
dat
```

```
##    app.timing  air.temp  wind.2m  rain.rate             app.mthd incorp t.incorp app.rate.ni        man.source  acid man.dm man.ph  ct
## 1       Marts  4.275188 4.041868 0.05565767        Trailing hose   None       NA          30        Svinegylle FALSE    3.9   7.20 168
## 2       April  8.197490 3.813572 0.11693835        Trailing hose   None       NA          30        Svinegylle FALSE    3.9   7.20 168
## 3         Maj 12.375139 3.455675 0.07178040        Trailing hose   None       NA          30        Svinegylle FALSE    3.9   7.20 168
## 4      Sommer 16.818530 3.108839 0.10705033        Trailing hose   None       NA          30        Svinegylle FALSE    3.9   7.20 168
## 5     Efterår 14.397146 3.308799 0.12892764        Trailing hose   None       NA          30        Svinegylle FALSE    3.9   7.20 168
## 6       Marts  4.275188 4.041868 0.05565767        Trailing hose   Deep        4          30        Svinegylle FALSE    3.9   7.20 168
## 7       April  8.197490 3.813572 0.11693835        Trailing hose   Deep        4          30        Svinegylle FALSE    3.9   7.20 168
## 8         Maj 12.375139 3.455675 0.07178040        Trailing hose   Deep        4          30        Svinegylle FALSE    3.9   7.20 168
## 9      Sommer 16.818530 3.108839 0.10705033        Trailing hose   Deep        4          30        Svinegylle FALSE    3.9   7.20 168
## 10    Efterår 14.397146 3.308799 0.12892764        Trailing hose   Deep        4          30        Svinegylle FALSE    3.9   7.20 168
## 11      Marts  4.275188 4.041868 0.05565767   Open slot injection   None       NA           0        Svinegylle FALSE    3.9   7.20 168
```

```
## 12      April  8.197490 3.813572 0.11693835   Open slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 13        Maj 12.375139 3.455675 0.07178040   Open slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 14     Sommer 16.818530 3.108839 0.10705033   Open slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 15    Efterår 14.397146 3.308799 0.12892764   Open slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 16      Marts  4.275188 4.041868 0.05565767 Closed slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 17      April  8.197490 3.813572 0.11693835 Closed slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 18        Maj 12.375139 3.455675 0.07178040 Closed slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 19     Sommer 16.818530 3.108839 0.10705033 Closed slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 20    Efterår 14.397146 3.308799 0.12892764 Closed slot injection   None       NA          0        Svinegylle FALSE    3.9   7.20 168
## 21      Marts  4.275188 4.041868 0.05565767         Trailing hose   None       NA         30         Kvæggylle FALSE    6.5   7.00 168
## 22      April  8.197490 3.813572 0.11693835         Trailing hose   None       NA         30         Kvæggylle FALSE    6.5   7.00 168
## 23        Maj 12.375139 3.455675 0.07178040         Trailing hose   None       NA         30         Kvæggylle FALSE    6.5   7.00 168
## 24     Sommer 16.818530 3.108839 0.10705033         Trailing hose   None       NA         30         Kvæggylle FALSE    6.5   7.00 168
## 25    Efterår 14.397146 3.308799 0.12892764         Trailing hose   None       NA         30         Kvæggylle FALSE    6.5   7.00 168
## 26      Marts  4.275188 4.041868 0.05565767         Trailing hose   Deep        4         30         Kvæggylle FALSE    6.5   7.00 168
## 27      April  8.197490 3.813572 0.11693835         Trailing hose   Deep        4         30         Kvæggylle FALSE    6.5   7.00 168
## 28        Maj 12.375139 3.455675 0.07178040         Trailing hose   Deep        4         30         Kvæggylle FALSE    6.5   7.00 168
## 29     Sommer 16.818530 3.108839 0.10705033         Trailing hose   Deep        4         30         Kvæggylle FALSE    6.5   7.00 168
## 30    Efterår 14.397146 3.308799 0.12892764         Trailing hose   Deep        4         30         Kvæggylle FALSE    6.5   7.00 168
## 31      Marts  4.275188 4.041868 0.05565767   Open slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 32      April  8.197490 3.813572 0.11693835   Open slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 33        Maj 12.375139 3.455675 0.07178040   Open slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 34     Sommer 16.818530 3.108839 0.10705033   Open slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 35    Efterår 14.397146 3.308799 0.12892764   Open slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 36      Marts  4.275188 4.041868 0.05565767 Closed slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 37      April  8.197490 3.813572 0.11693835 Closed slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 38        Maj 12.375139 3.455675 0.07178040 Closed slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 39     Sommer 16.818530 3.108839 0.10705033 Closed slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 40    Efterår 14.397146 3.308799 0.12892764 Closed slot injection   None       NA          0         Kvæggylle FALSE    6.5   7.00 168
## 41      Marts  4.275188 4.041868 0.05565767         Trailing hose   None       NA         30 Afgasset biomasse FALSE    5.1   7.90 168
## 42      April  8.197490 3.813572 0.11693835         Trailing hose   None       NA         30 Afgasset biomasse FALSE    5.1   7.90 168
## 43        Maj 12.375139 3.455675 0.07178040         Trailing hose   None       NA         30 Afgasset biomasse FALSE    5.1   7.90 168
## 44     Sommer 16.818530 3.108839 0.10705033         Trailing hose   None       NA         30 Afgasset biomasse FALSE    5.1   7.90 168
## 45    Efterår 14.397146 3.308799 0.12892764         Trailing hose   None       NA         30 Afgasset biomasse FALSE    5.1   7.90 168
## 46      Marts  4.275188 4.041868 0.05565767         Trailing hose   Deep        4         30 Afgasset biomasse FALSE    5.1   7.90 168
## 47      April  8.197490 3.813572 0.11693835         Trailing hose   Deep        4         30 Afgasset biomasse FALSE    5.1   7.90 168
## 48        Maj 12.375139 3.455675 0.07178040         Trailing hose   Deep        4         30 Afgasset biomasse FALSE    5.1   7.90 168
## 49     Sommer 16.818530 3.108839 0.10705033         Trailing hose   Deep        4         30 Afgasset biomasse FALSE    5.1   7.90 168
## 50    Efterår 14.397146 3.308799 0.12892764         Trailing hose   Deep        4         30 Afgasset biomasse FALSE    5.1   7.90 168
```

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## 51      Marts  4.275188 4.041868 0.05565767   Open slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 52      April  8.197490 3.813572 0.11693835   Open slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 53        Maj 12.375139 3.455675 0.07178040   Open slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 54     Sommer 16.818530 3.108839 0.10705033   Open slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 55    Efterår 14.397146 3.308799 0.12892764   Open slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 56      Marts  4.275188 4.041868 0.05565767 Closed slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 57      April  8.197490 3.813572 0.11693835 Closed slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 58        Maj 12.375139 3.455675 0.07178040 Closed slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 59     Sommer 16.818530 3.108839 0.10705033 Closed slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 60    Efterår 14.397146 3.308799 0.12892764 Closed slot injection   None       NA           0 Afgasset biomasse FALSE    5.1   7.90 168
## 61      Marts  4.275188 4.041868 0.05565767         Trailing hose   None       NA          30        Svinegylle  TRUE    3.9   6.47 168
## 62      April  8.197490 3.813572 0.11693835         Trailing hose   None       NA          30        Svinegylle  TRUE    3.9   6.47 168
## 63        Maj 12.375139 3.455675 0.07178040         Trailing hose   None       NA          30        Svinegylle  TRUE    3.9   6.47 168
## 64     Sommer 16.818530 3.108839 0.10705033         Trailing hose   None       NA          30        Svinegylle  TRUE    3.9   6.47 168
## 65    Efterår 14.397146 3.308799 0.12892764         Trailing hose   None       NA          30        Svinegylle  TRUE    3.9   6.47 168
## 66      Marts  4.275188 4.041868 0.05565767         Trailing hose   None       NA          30         Kvæggylle  TRUE    6.5   6.47 168
## 67      April  8.197490 3.813572 0.11693835         Trailing hose   None       NA          30         Kvæggylle  TRUE    6.5   6.47 168
## 68        Maj 12.375139 3.455675 0.07178040         Trailing hose   None       NA          30         Kvæggylle  TRUE    6.5   6.47 168
## 69     Sommer 16.818530 3.108839 0.10705033         Trailing hose   None       NA          30         Kvæggylle  TRUE    6.5   6.47 168
## 70    Efterår 14.397146 3.308799 0.12892764         Trailing hose   None       NA          30         Kvæggylle  TRUE    6.5   6.47 168
## 71      Marts  4.275188 4.041868 0.05565767         Trailing hose   None       NA          30 Afgasset biomasse  TRUE    5.1   6.52 168
## 72      April  8.197490 3.813572 0.11693835         Trailing hose   None       NA          30 Afgasset biomasse  TRUE    5.1   6.52 168
## 73        Maj 12.375139 3.455675 0.07178040         Trailing hose   None       NA          30 Afgasset biomasse  TRUE    5.1   6.52 168
## 74     Sommer 16.818530 3.108839 0.10705033         Trailing hose   None       NA          30 Afgasset biomasse  TRUE    5.1   6.52 168
## 75    Efterår 14.397146 3.308799 0.12892764         Trailing hose   None       NA          30 Afgasset biomasse  TRUE    5.1   6.52 168
```

Run model

With set 2 parameters

```
preds <- ALFAM2mod(dat, pars = ALFAM2pars02, app.name = 'tan.app', time.name = 'ct',
                   time.incorp = 't.incorp', group = 'id', warn = TRUE, prep = TRUE)
```

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

## Incorporation applied (for group 10).

## Incorporation applied (for group 26).

## Incorporation applied (for group 27).

## Incorporation applied (for group 28).
```

```
## Incorporation applied (for group 29).
## Incorporation applied (for group 30).
## Incorporation applied (for group 46).
## Incorporation applied (for group 47).
## Incorporation applied (for group 48).
## Incorporation applied (for group 49).
## Incorporation applied (for group 50).
## Incorporation applied (for group 6).
## Incorporation applied (for group 7).
## Incorporation applied (for group 8).
## Incorporation applied (for group 9).
## Warning in ALFAM2mod(dat, pars = ALFAM2pars02, app.name = "tan.app", time.name = "ct", : Running with 18 parameters. Dropped 6 with no
## These secondary parameters have been dropped:
##   app.mthd.bc.r1
##   app.mthd.ts.r1
##   ts.cereal.hght.r1
##   app.mthd.bc.r3
##   incorp.shallow.f4
##   incorp.shallow.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
##   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
##   incorp.deep.f4
##   incorp.deep.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

## 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        j        e    e.int        er
```

```
## 1 168 168 0.3237724 0.06628499 0.1110777 0.001255181  1 3.7119e-12 71.30525 0.1708021 28.69475 28.69475 0.2869475
```

```
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
## 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         j        e    e.int        er
## 1 168 168 0.2589096 0.115023 0.01587869 0.0005910004  1 7.283926e-09 69.96107 0.1788032 30.03893 30.03893 0.3003893
```

Add results to main df

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