Model call record

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

```
dat
```

```
##    app.timing air.temp wind.2m rain.rate             app.mthd incorp t.incorp app.rate.ni        man.source  acid
## 1       Marts    4.900 4.02500     0.056         Trailing hose   None       NA          30        Svinegylle FALSE
## 2       April    8.500 3.91000     0.120         Trailing hose   None       NA          30        Svinegylle FALSE
## 3         Maj   12.400 3.56500     0.072         Trailing hose   None       NA          30        Svinegylle FALSE
## 4      Sommer   16.867 3.18167     0.110         Trailing hose   None       NA          30        Svinegylle FALSE
## 5     Efterår   14.600 3.45000     0.130         Trailing hose   None       NA          30        Svinegylle FALSE
## 6       Marts    4.900 4.02500     0.056         Trailing hose   Deep        4          30        Svinegylle FALSE
## 7       April    8.500 3.91000     0.120         Trailing hose   Deep        4          30        Svinegylle FALSE
```

```
## 8         Maj   12.400 3.56500     0.072         Trailing hose   Deep        4          30        Svinegylle FALSE
## 9      Sommer   16.867 3.18167     0.110         Trailing hose   Deep        4          30        Svinegylle FALSE
## 10    Efterår   14.600 3.45000     0.130         Trailing hose   Deep        4          30        Svinegylle FALSE
## 11      Marts    4.900 4.02500     0.056   Open slot injection   None       NA           0        Svinegylle FALSE
## 12      April    8.500 3.91000     0.120   Open slot injection   None       NA           0        Svinegylle FALSE
## 13        Maj   12.400 3.56500     0.072   Open slot injection   None       NA           0        Svinegylle FALSE
## 14     Sommer   16.867 3.18167     0.110   Open slot injection   None       NA           0        Svinegylle FALSE
## 15    Efterår   14.600 3.45000     0.130   Open slot injection   None       NA           0        Svinegylle FALSE
## 16      Marts    4.900 4.02500     0.056 Closed slot injection   None       NA           0        Svinegylle FALSE
## 17      April    8.500 3.91000     0.120 Closed slot injection   None       NA           0        Svinegylle FALSE
## 18        Maj   12.400 3.56500     0.072 Closed slot injection   None       NA           0        Svinegylle FALSE
## 19     Sommer   16.867 3.18167     0.110 Closed slot injection   None       NA           0        Svinegylle FALSE
## 20    Efterår   14.600 3.45000     0.130 Closed slot injection   None       NA           0        Svinegylle FALSE
## 21      Marts    4.900 4.02500     0.056         Trailing hose   None       NA          30         Kvæggylle FALSE
## 22      April    8.500 3.91000     0.120         Trailing hose   None       NA          30         Kvæggylle FALSE
## 23        Maj   12.400 3.56500     0.072         Trailing hose   None       NA          30         Kvæggylle FALSE
## 24     Sommer   16.867 3.18167     0.110         Trailing hose   None       NA          30         Kvæggylle FALSE
## 25    Efterår   14.600 3.45000     0.130         Trailing hose   None       NA          30         Kvæggylle FALSE
## 26      Marts    4.900 4.02500     0.056         Trailing hose   Deep        4          30         Kvæggylle FALSE
## 27      April    8.500 3.91000     0.120         Trailing hose   Deep        4          30         Kvæggylle FALSE
## 28        Maj   12.400 3.56500     0.072         Trailing hose   Deep        4          30         Kvæggylle FALSE
## 29     Sommer   16.867 3.18167     0.110         Trailing hose   Deep        4          30         Kvæggylle FALSE
## 30    Efterår   14.600 3.45000     0.130         Trailing hose   Deep        4          30         Kvæggylle FALSE
## 31      Marts    4.900 4.02500     0.056   Open slot injection   None       NA           0         Kvæggylle FALSE
## 32      April    8.500 3.91000     0.120   Open slot injection   None       NA           0         Kvæggylle FALSE
## 33        Maj   12.400 3.56500     0.072   Open slot injection   None       NA           0         Kvæggylle FALSE
## 34     Sommer   16.867 3.18167     0.110   Open slot injection   None       NA           0         Kvæggylle FALSE
## 35    Efterår   14.600 3.45000     0.130   Open slot injection   None       NA           0         Kvæggylle FALSE
## 36      Marts    4.900 4.02500     0.056 Closed slot injection   None       NA           0         Kvæggylle FALSE
## 37      April    8.500 3.91000     0.120 Closed slot injection   None       NA           0         Kvæggylle FALSE
## 38        Maj   12.400 3.56500     0.072 Closed slot injection   None       NA           0         Kvæggylle FALSE
## 39     Sommer   16.867 3.18167     0.110 Closed slot injection   None       NA           0         Kvæggylle FALSE
## 40    Efterår   14.600 3.45000     0.130 Closed slot injection   None       NA           0         Kvæggylle FALSE
## 41      Marts    4.900 4.02500     0.056         Trailing hose   None       NA          30 Afgasset biomasse FALSE
## 42      April    8.500 3.91000     0.120         Trailing hose   None       NA          30 Afgasset biomasse FALSE
## 43        Maj   12.400 3.56500     0.072         Trailing hose   None       NA          30 Afgasset biomasse FALSE
## 44     Sommer   16.867 3.18167     0.110         Trailing hose   None       NA          30 Afgasset biomasse FALSE
## 45    Efterår   14.600 3.45000     0.130         Trailing hose   None       NA          30 Afgasset biomasse FALSE
## 46      Marts    4.900 4.02500     0.056         Trailing hose   Deep        4          30 Afgasset biomasse FALSE
```

```
## 47      April    8.500 3.91000     0.120         Trailing hose   Deep        4          30 Afgasset biomasse FALSE
## 48        Maj   12.400 3.56500     0.072         Trailing hose   Deep        4          30 Afgasset biomasse FALSE
## 49     Sommer   16.867 3.18167     0.110         Trailing hose   Deep        4          30 Afgasset biomasse FALSE
## 50    Efterår   14.600 3.45000     0.130         Trailing hose   Deep        4          30 Afgasset biomasse FALSE
## 51      Marts    4.900 4.02500     0.056   Open slot injection   None       NA           0 Afgasset biomasse FALSE
## 52      April    8.500 3.91000     0.120   Open slot injection   None       NA           0 Afgasset biomasse FALSE
## 53        Maj   12.400 3.56500     0.072   Open slot injection   None       NA           0 Afgasset biomasse FALSE
## 54     Sommer   16.867 3.18167     0.110   Open slot injection   None       NA           0 Afgasset biomasse FALSE
## 55    Efterår   14.600 3.45000     0.130   Open slot injection   None       NA           0 Afgasset biomasse FALSE
## 56      Marts    4.900 4.02500     0.056 Closed slot injection   None       NA           0 Afgasset biomasse FALSE
## 57      April    8.500 3.91000     0.120 Closed slot injection   None       NA           0 Afgasset biomasse FALSE
## 58        Maj   12.400 3.56500     0.072 Closed slot injection   None       NA           0 Afgasset biomasse FALSE
## 59     Sommer   16.867 3.18167     0.110 Closed slot injection   None       NA           0 Afgasset biomasse FALSE
## 60    Efterår   14.600 3.45000     0.130 Closed slot injection   None       NA           0 Afgasset biomasse FALSE
## 61      Marts    4.900 4.02500     0.056         Trailing hose   None       NA          30        Svinegylle  TRUE
## 62      April    8.500 3.91000     0.120         Trailing hose   None       NA          30        Svinegylle  TRUE
## 63        Maj   12.400 3.56500     0.072         Trailing hose   None       NA          30        Svinegylle  TRUE
## 64     Sommer   16.867 3.18167     0.110         Trailing hose   None       NA          30        Svinegylle  TRUE
## 65    Efterår   14.600 3.45000     0.130         Trailing hose   None       NA          30        Svinegylle  TRUE
## 66      Marts    4.900 4.02500     0.056         Trailing hose   None       NA          30         Kvæggylle  TRUE
## 67      April    8.500 3.91000     0.120         Trailing hose   None       NA          30         Kvæggylle  TRUE
## 68        Maj   12.400 3.56500     0.072         Trailing hose   None       NA          30         Kvæggylle  TRUE
## 69     Sommer   16.867 3.18167     0.110         Trailing hose   None       NA          30         Kvæggylle  TRUE
## 70    Efterår   14.600 3.45000     0.130         Trailing hose   None       NA          30         Kvæggylle  TRUE
## 71      Marts    4.900 4.02500     0.056         Trailing hose   None       NA          30 Afgasset biomasse  TRUE
## 72      April    8.500 3.91000     0.120         Trailing hose   None       NA          30 Afgasset biomasse  TRUE
## 73        Maj   12.400 3.56500     0.072         Trailing hose   None       NA          30 Afgasset biomasse  TRUE
## 74     Sommer   16.867 3.18167     0.110         Trailing hose   None       NA          30 Afgasset biomasse  TRUE
## 75    Efterår   14.600 3.45000     0.130         Trailing hose   None       NA          30 Afgasset biomasse  TRUE
##    man.dm man.ph  ct tan.app id
## 1     3.9   7.20 168     100  1
## 2     3.9   7.20 168     100  2
## 3     3.9   7.20 168     100  3
## 4     3.9   7.20 168     100  4
## 5     3.9   7.20 168     100  5
## 6     3.9   7.20 168     100  6
## 7     3.9   7.20 168     100  7
## 8     3.9   7.20 168     100  8
## 9     3.9   7.20 168     100  9
```

```
## 10    3.9   7.20 168     100 10
## 11    3.9   7.20 168     100 11
## 12    3.9   7.20 168     100 12
## 13    3.9   7.20 168     100 13
## 14    3.9   7.20 168     100 14
## 15    3.9   7.20 168     100 15
## 16    3.9   7.20 168     100 16
## 17    3.9   7.20 168     100 17
## 18    3.9   7.20 168     100 18
## 19    3.9   7.20 168     100 19
## 20    3.9   7.20 168     100 20
## 21    6.5   7.00 168     100 21
## 22    6.5   7.00 168     100 22
## 23    6.5   7.00 168     100 23
## 24    6.5   7.00 168     100 24
## 25    6.5   7.00 168     100 25
## 26    6.5   7.00 168     100 26
## 27    6.5   7.00 168     100 27
## 28    6.5   7.00 168     100 28
## 29    6.5   7.00 168     100 29
## 30    6.5   7.00 168     100 30
## 31    6.5   7.00 168     100 31
## 32    6.5   7.00 168     100 32
## 33    6.5   7.00 168     100 33
## 34    6.5   7.00 168     100 34
## 35    6.5   7.00 168     100 35
## 36    6.5   7.00 168     100 36
## 37    6.5   7.00 168     100 37
## 38    6.5   7.00 168     100 38
## 39    6.5   7.00 168     100 39
## 40    6.5   7.00 168     100 40
## 41    5.1   7.90 168     100 41
## 42    5.1   7.90 168     100 42
## 43    5.1   7.90 168     100 43
## 44    5.1   7.90 168     100 44
## 45    5.1   7.90 168     100 45
## 46    5.1   7.90 168     100 46
## 47    5.1   7.90 168     100 47
## 48    5.1   7.90 168     100 48
```

```
## 49    5.1   7.90 168     100 49
## 50    5.1   7.90 168     100 50
## 51    5.1   7.90 168     100 51
## 52    5.1   7.90 168     100 52
## 53    5.1   7.90 168     100 53
## 54    5.1   7.90 168     100 54
## 55    5.1   7.90 168     100 55
## 56    5.1   7.90 168     100 56
## 57    5.1   7.90 168     100 57
## 58    5.1   7.90 168     100 58
## 59    5.1   7.90 168     100 59
## 60    5.1   7.90 168     100 60
## 61    3.9   6.47 168     100 61
## 62    3.9   6.47 168     100 62
## 63    3.9   6.47 168     100 63
## 64    3.9   6.47 168     100 64
## 65    3.9   6.47 168     100 65
## 66    6.5   6.47 168     100 66
## 67    6.5   6.47 168     100 67
## 68    6.5   6.47 168     100 68
## 69    6.5   6.47 168     100 69
## 70    6.5   6.47 168     100 70
## 71    5.1   6.52 168     100 71
## 72    5.1   6.52 168     100 72
## 73    5.1   6.52 168     100 73
## 74    5.1   6.52 168     100 74
## 75    5.1   6.52 168     100 75
```

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(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         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(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         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

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