Model call record

Sasha D. Hafner

Calculates emission factors

Check package version.

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

```
## [1] '1.5.5'
```

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.dk app.timing  air.temp  wind.2m  rain.rate             app.mthd app.rate.ni        man.source
## 1          Marts      March  4.431012 4.058916 0.05996290        Trailing hose          30 Afgasset biomasse
## 2          April      April  8.236460 3.844456 0.05521194        Trailing hose          30 Afgasset biomasse
## 3            Maj        May 12.449250 3.483915 0.07029935        Trailing hose          30 Afgasset biomasse
## 4         Sommer     Summer 16.876226 3.156240 0.10592531        Trailing hose          30 Afgasset biomasse
## 5        Efterår     Autumn 14.497748 3.322770 0.12826017        Trailing hose          30 Afgasset biomasse
## 6          Marts      March  4.431012 4.058916 0.05996290  Open slot injection           0 Afgasset biomasse
## 7          April      April  8.236460 3.844456 0.05521194  Open slot injection           0 Afgasset biomasse
## 8            Maj        May 12.449250 3.483915 0.07029935  Open slot injection           0 Afgasset biomasse
```

```
## 9        Sommer     Summer 16.876226 3.156240 0.10592531   Open slot injection          0 Afgasset biomasse
## 10       Efterår    Autumn 14.497748 3.322770 0.12826017   Open slot injection          0 Afgasset biomasse
## 11         Marts     March  4.431012 4.058916 0.05996290 Closed slot injection          0 Afgasset biomasse
## 12         April     April  8.236460 3.844456 0.05521194 Closed slot injection          0 Afgasset biomasse
## 13           Maj       May 12.449250 3.483915 0.07029935 Closed slot injection          0 Afgasset biomasse
## 14       Sommer     Summer 16.876226 3.156240 0.10592531 Closed slot injection          0 Afgasset biomasse
## 15       Efterår    Autumn 14.497748 3.322770 0.12826017 Closed slot injection          0 Afgasset biomasse
## 16         Marts     March  4.431012 4.058916 0.05996290         Trailing hose         30 Afgasset biomasse
## 17         April     April  8.236460 3.844456 0.05521194         Trailing hose         30 Afgasset biomasse
## 18           Maj       May 12.449250 3.483915 0.07029935         Trailing hose         30 Afgasset biomasse
## 19       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose         30 Afgasset biomasse
## 20       Efterår    Autumn 14.497748 3.322770 0.12826017         Trailing hose         30 Afgasset biomasse
## 21         Marts     March  4.431012 4.058916 0.05996290         Trailing hose         30 Afgasset biomasse
## 22         April     April  8.236460 3.844456 0.05521194         Trailing hose         30 Afgasset biomasse
## 23           Maj       May 12.449250 3.483915 0.07029935         Trailing hose         30 Afgasset biomasse
## 24       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose         30 Afgasset biomasse
## 25       Efterår    Autumn 14.497748 3.322770 0.12826017         Trailing hose         30 Afgasset biomasse
## 26         Marts     March  4.431012 4.058916 0.05996290         Trailing hose         30 Afgasset biomasse
## 27         April     April  8.236460 3.844456 0.05521194         Trailing hose         30 Afgasset biomasse
## 28           Maj       May 12.449250 3.483915 0.07029935         Trailing hose         30 Afgasset biomasse
## 29       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose         30 Afgasset biomasse
## 30       Efterår    Autumn 14.497748 3.322770 0.12826017         Trailing hose         30 Afgasset biomasse
## 31         Marts     March  4.431012 4.058916 0.05996290         Trailing hose         30 Afgasset biomasse
## 32         April     April  8.236460 3.844456 0.05521194         Trailing hose         30 Afgasset biomasse
## 33           Maj       May 12.449250 3.483915 0.07029935         Trailing hose         30 Afgasset biomasse
## 34       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose         30 Afgasset biomasse
## 35       Efterår    Autumn 14.497748 3.322770 0.12826017         Trailing hose         30 Afgasset biomasse
## 36         Marts     March  4.431012 4.058916 0.05996290   Open slot injection          0 Afgasset biomasse
## 37         April     April  8.236460 3.844456 0.05521194   Open slot injection          0 Afgasset biomasse
## 38           Maj       May 12.449250 3.483915 0.07029935   Open slot injection          0 Afgasset biomasse
## 39       Sommer     Summer 16.876226 3.156240 0.10592531   Open slot injection          0 Afgasset biomasse
## 40       Efterår    Autumn 14.497748 3.322770 0.12826017   Open slot injection          0 Afgasset biomasse
## 41         Marts     March  4.431012 4.058916 0.05996290 Closed slot injection          0 Afgasset biomasse
## 42         April     April  8.236460 3.844456 0.05521194 Closed slot injection          0 Afgasset biomasse
## 43           Maj       May 12.449250 3.483915 0.07029935 Closed slot injection          0 Afgasset biomasse
## 44       Sommer     Summer 16.876226 3.156240 0.10592531 Closed slot injection          0 Afgasset biomasse
## 45       Efterår    Autumn 14.497748 3.322770 0.12826017 Closed slot injection          0 Afgasset biomasse
## 46         Marts     March  4.431012 4.058916 0.05996290         Trailing hose         30 Afgasset biomasse
## 47         April     April  8.236460 3.844456 0.05521194         Trailing hose         30 Afgasset biomasse
```

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## 48          Maj        May 12.449250 3.483915 0.07029935         Trailing hose          30 Afgasset biomasse
## 49       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose          30 Afgasset biomasse
## 50      Efterår     Autumn 14.497748 3.322770 0.12826017         Trailing hose          30 Afgasset biomasse
## 51        Marts      March  4.431012 4.058916 0.05996290         Trailing hose          30 Afgasset biomasse
## 52        April      April  8.236460 3.844456 0.05521194         Trailing hose          30 Afgasset biomasse
## 53          Maj        May 12.449250 3.483915 0.07029935         Trailing hose          30 Afgasset biomasse
## 54       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose          30 Afgasset biomasse
## 55      Efterår     Autumn 14.497748 3.322770 0.12826017         Trailing hose          30 Afgasset biomasse
## 56        Marts      March  4.431012 4.058916 0.05996290         Trailing hose          30 Afgasset biomasse
## 57        April      April  8.236460 3.844456 0.05521194         Trailing hose          30 Afgasset biomasse
## 58          Maj        May 12.449250 3.483915 0.07029935         Trailing hose          30 Afgasset biomasse
## 59       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose          30 Afgasset biomasse
## 60      Efterår     Autumn 14.497748 3.322770 0.12826017         Trailing hose          30 Afgasset biomasse
## 61        Marts      March  4.431012 4.058916 0.05996290         Trailing hose          30 Afgasset biomasse
## 62        April      April  8.236460 3.844456 0.05521194         Trailing hose          30 Afgasset biomasse
## 63          Maj        May 12.449250 3.483915 0.07029935         Trailing hose          30 Afgasset biomasse
## 64       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose          30 Afgasset biomasse
## 65      Efterår     Autumn 14.497748 3.322770 0.12826017         Trailing hose          30 Afgasset biomasse
## 66        Marts      March  4.431012 4.058916 0.05996290   Open slot injection           0 Afgasset biomasse
## 67        April      April  8.236460 3.844456 0.05521194   Open slot injection           0 Afgasset biomasse
## 68          Maj        May 12.449250 3.483915 0.07029935   Open slot injection           0 Afgasset biomasse
## 69       Sommer     Summer 16.876226 3.156240 0.10592531   Open slot injection           0 Afgasset biomasse
## 70      Efterår     Autumn 14.497748 3.322770 0.12826017   Open slot injection           0 Afgasset biomasse
## 71        Marts      March  4.431012 4.058916 0.05996290 Closed slot injection           0 Afgasset biomasse
## 72        April      April  8.236460 3.844456 0.05521194 Closed slot injection           0 Afgasset biomasse
## 73          Maj        May 12.449250 3.483915 0.07029935 Closed slot injection           0 Afgasset biomasse
## 74       Sommer     Summer 16.876226 3.156240 0.10592531 Closed slot injection           0 Afgasset biomasse
## 75      Efterår     Autumn 14.497748 3.322770 0.12826017 Closed slot injection           0 Afgasset biomasse
## 76        Marts      March  4.431012 4.058916 0.05996290         Trailing hose          30 Afgasset biomasse
## 77        April      April  8.236460 3.844456 0.05521194         Trailing hose          30 Afgasset biomasse
## 78          Maj        May 12.449250 3.483915 0.07029935         Trailing hose          30 Afgasset biomasse
## 79       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose          30 Afgasset biomasse
## 80      Efterår     Autumn 14.497748 3.322770 0.12826017         Trailing hose          30 Afgasset biomasse
## 81        Marts      March  4.431012 4.058916 0.05996290         Trailing hose          30 Afgasset biomasse
## 82        April      April  8.236460 3.844456 0.05521194         Trailing hose          30 Afgasset biomasse
## 83          Maj        May 12.449250 3.483915 0.07029935         Trailing hose          30 Afgasset biomasse
## 84       Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose          30 Afgasset biomasse
## 85      Efterår     Autumn 14.497748 3.322770 0.12826017         Trailing hose          30 Afgasset biomasse
## 86        Marts      March  4.431012 4.058916 0.05996290         Trailing hose          30 Afgasset biomasse
```

```
## 87         April      April  8.236460 3.844456 0.05521194         Trailing hose          30 Afgasset biomasse
## 88           Maj        May 12.449250 3.483915 0.07029935         Trailing hose          30 Afgasset biomasse
## 89        Sommer     Summer 16.876226 3.156240 0.10592531         Trailing hose          30 Afgasset biomasse
## 90       Efterår     Autumn 14.497748 3.322770 0.12826017         Trailing hose          30 Afgasset biomasse
##        acid man.dm man.ph  ct tan.app id
## 1     0 kg/t    5.1 7.9000 168     100  1
## 2     0 kg/t    5.1 7.9000 168     100  2
## 3     0 kg/t    5.1 7.9000 168     100  3
## 4     0 kg/t    5.1 7.9000 168     100  4
## 5     0 kg/t    5.1 7.9000 168     100  5
## 6     0 kg/t    5.1 7.9000 168     100  6
## 7     0 kg/t    5.1 7.9000 168     100  7
## 8     0 kg/t    5.1 7.9000 168     100  8
## 9     0 kg/t    5.1 7.9000 168     100  9
## 10    0 kg/t    5.1 7.9000 168     100 10
## 11    0 kg/t    5.1 7.9000 168     100 11
## 12    0 kg/t    5.1 7.9000 168     100 12
## 13    0 kg/t    5.1 7.9000 168     100 13
## 14    0 kg/t    5.1 7.9000 168     100 14
## 15    0 kg/t    5.1 7.9000 168     100 15
## 16   11 kg/t    5.1 6.5200 168     100 16
## 17   11 kg/t    5.1 6.5200 168     100 17
## 18   11 kg/t    5.1 6.5200 168     100 18
## 19   11 kg/t    5.1 6.5200 168     100 19
## 20   11 kg/t    5.1 6.5200 168     100 20
## 21 3.4 kg/t    5.1 7.0813 168     100 21
## 22 3.4 kg/t    5.1 7.0813 168     100 22
## 23 3.4 kg/t    5.1 7.0813 168     100 23
## 24 3.4 kg/t    5.1 7.0813 168     100 24
## 25 3.4 kg/t    5.1 7.0813 168     100 25
## 26 7.5 kg/t    5.1 6.7900 168     100 26
## 27 7.5 kg/t    5.1 6.7900 168     100 27
## 28 7.5 kg/t    5.1 6.7900 168     100 28
## 29 7.5 kg/t    5.1 6.7900 168     100 29
## 30 7.5 kg/t    5.1 6.7900 168     100 30
## 31    0 kg/t    5.9 7.9000 168     100 31
## 32    0 kg/t    5.9 7.9000 168     100 32
## 33    0 kg/t    5.9 7.9000 168     100 33
## 34    0 kg/t    5.9 7.9000 168     100 34
```

```
## 35   0 kg/t    5.9 7.9000 168     100 35
## 36   0 kg/t    5.9 7.9000 168     100 36
## 37   0 kg/t    5.9 7.9000 168     100 37
## 38   0 kg/t    5.9 7.9000 168     100 38
## 39   0 kg/t    5.9 7.9000 168     100 39
## 40   0 kg/t    5.9 7.9000 168     100 40
## 41   0 kg/t    5.9 7.9000 168     100 41
## 42   0 kg/t    5.9 7.9000 168     100 42
## 43   0 kg/t    5.9 7.9000 168     100 43
## 44   0 kg/t    5.9 7.9000 168     100 44
## 45   0 kg/t    5.9 7.9000 168     100 45
## 46  11 kg/t    5.9 6.5200 168     100 46
## 47  11 kg/t    5.9 6.5200 168     100 47
## 48  11 kg/t    5.9 6.5200 168     100 48
## 49  11 kg/t    5.9 6.5200 168     100 49
## 50  11 kg/t    5.9 6.5200 168     100 50
## 51 3.4 kg/t    5.9 7.0813 168     100 51
## 52 3.4 kg/t    5.9 7.0813 168     100 52
## 53 3.4 kg/t    5.9 7.0813 168     100 53
## 54 3.4 kg/t    5.9 7.0813 168     100 54
## 55 3.4 kg/t    5.9 7.0813 168     100 55
## 56 7.5 kg/t    5.9 6.7900 168     100 56
## 57 7.5 kg/t    5.9 6.7900 168     100 57
## 58 7.5 kg/t    5.9 6.7900 168     100 58
## 59 7.5 kg/t    5.9 6.7900 168     100 59
## 60 7.5 kg/t    5.9 6.7900 168     100 60
## 61   0 kg/t    6.9 7.9000 168     100 61
## 62   0 kg/t    6.9 7.9000 168     100 62
## 63   0 kg/t    6.9 7.9000 168     100 63
## 64   0 kg/t    6.9 7.9000 168     100 64
## 65   0 kg/t    6.9 7.9000 168     100 65
## 66   0 kg/t    6.9 7.9000 168     100 66
## 67   0 kg/t    6.9 7.9000 168     100 67
## 68   0 kg/t    6.9 7.9000 168     100 68
## 69   0 kg/t    6.9 7.9000 168     100 69
## 70   0 kg/t    6.9 7.9000 168     100 70
## 71   0 kg/t    6.9 7.9000 168     100 71
## 72   0 kg/t    6.9 7.9000 168     100 72
## 73   0 kg/t    6.9 7.9000 168     100 73
```

```
## 74   0 kg/t    6.9 7.9000 168     100 74
## 75   0 kg/t    6.9 7.9000 168     100 75
## 76  11 kg/t    6.9 6.5200 168     100 76
## 77  11 kg/t    6.9 6.5200 168     100 77
## 78  11 kg/t    6.9 6.5200 168     100 78
## 79  11 kg/t    6.9 6.5200 168     100 79
## 80  11 kg/t    6.9 6.5200 168     100 80
## 81 3.4 kg/t    6.9 7.0813 168     100 81
## 82 3.4 kg/t    6.9 7.0813 168     100 82
## 83 3.4 kg/t    6.9 7.0813 168     100 83
## 84 3.4 kg/t    6.9 7.0813 168     100 84
## 85 3.4 kg/t    6.9 7.0813 168     100 85
## 86 7.5 kg/t    6.9 6.7900 168     100 86
## 87 7.5 kg/t    6.9 6.7900 168     100 87
## 88 7.5 kg/t    6.9 6.7900 168     100 88
## 89 7.5 kg/t    6.9 6.7900 168     100 89
## 90 7.5 kg/t    6.9 6.7900 168     100 90
```

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         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)
```