

Model call record

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Calculates emission factors

Check package version.

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

```
## [1] '1.2'
```

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	4.900	4.02500	0.09	Trailing hose
## 2	April	April	8.500	3.91000	0.09	Trailing hose
## 3	Maj	May	12.400	3.56500	0.09	Trailing hose

## 4	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 5	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 6	Marts	March	4.900	4.02500	0.09	Trailing hose
## 7	April	April	8.500	3.91000	0.09	Trailing hose
## 8	Maj	May	12.400	3.56500	0.09	Trailing hose
## 9	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 10	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 11	Marts	March	4.900	4.02500	0.09	Trailing hose
## 12	April	April	8.500	3.91000	0.09	Trailing hose
## 13	Maj	May	12.400	3.56500	0.09	Trailing hose
## 14	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 15	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 16	Marts	March	4.900	4.02500	0.09	Open slot injection
## 17	April	April	8.500	3.91000	0.09	Open slot injection
## 18	Maj	May	12.400	3.56500	0.09	Open slot injection
## 19	Sommer	Summer	16.867	3.18167	0.09	Open slot injection
## 20	Efterår	Autumn	14.600	3.45000	0.09	Open slot injection
## 21	Marts	March	4.900	4.02500	0.09	Closed slot injection
## 22	April	April	8.500	3.91000	0.09	Closed slot injection
## 23	Maj	May	12.400	3.56500	0.09	Closed slot injection
## 24	Sommer	Summer	16.867	3.18167	0.09	Closed slot injection
## 25	Efterår	Autumn	14.600	3.45000	0.09	Closed slot injection
## 26	Marts	March	4.900	4.02500	0.09	Trailing hose
## 27	April	April	8.500	3.91000	0.09	Trailing hose
## 28	Maj	May	12.400	3.56500	0.09	Trailing hose
## 29	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 30	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 31	Marts	March	4.900	4.02500	0.09	Trailing hose
## 32	April	April	8.500	3.91000	0.09	Trailing hose
## 33	Maj	May	12.400	3.56500	0.09	Trailing hose
## 34	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 35	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 36	Marts	March	4.900	4.02500	0.09	Trailing hose
## 37	April	April	8.500	3.91000	0.09	Trailing hose
## 38	Maj	May	12.400	3.56500	0.09	Trailing hose
## 39	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 40	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 41	Marts	March	4.900	4.02500	0.09	Open slot injection
## 42	April	April	8.500	3.91000	0.09	Open slot injection

## 43	Maj	May	12.400	3.56500	0.09	Open slot injection
## 44	Sommer	Summer	16.867	3.18167	0.09	Open slot injection
## 45	Efterår	Autumn	14.600	3.45000	0.09	Open slot injection
## 46	Marts	March	4.900	4.02500	0.09	Closed slot injection
## 47	April	April	8.500	3.91000	0.09	Closed slot injection
## 48	Maj	May	12.400	3.56500	0.09	Closed slot injection
## 49	Sommer	Summer	16.867	3.18167	0.09	Closed slot injection
## 50	Efterår	Autumn	14.600	3.45000	0.09	Closed slot injection
## 51	Marts	March	4.900	4.02500	0.09	Trailing hose
## 52	April	April	8.500	3.91000	0.09	Trailing hose
## 53	Maj	May	12.400	3.56500	0.09	Trailing hose
## 54	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 55	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 56	Marts	March	4.900	4.02500	0.09	Trailing hose
## 57	April	April	8.500	3.91000	0.09	Trailing hose
## 58	Maj	May	12.400	3.56500	0.09	Trailing hose
## 59	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 60	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 61	Marts	March	4.900	4.02500	0.09	Trailing hose
## 62	April	April	8.500	3.91000	0.09	Trailing hose
## 63	Maj	May	12.400	3.56500	0.09	Trailing hose
## 64	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 65	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 66	Marts	March	4.900	4.02500	0.09	Open slot injection
## 67	April	April	8.500	3.91000	0.09	Open slot injection
## 68	Maj	May	12.400	3.56500	0.09	Open slot injection
## 69	Sommer	Summer	16.867	3.18167	0.09	Open slot injection
## 70	Efterår	Autumn	14.600	3.45000	0.09	Open slot injection
## 71	Marts	March	4.900	4.02500	0.09	Closed slot injection
## 72	April	April	8.500	3.91000	0.09	Closed slot injection
## 73	Maj	May	12.400	3.56500	0.09	Closed slot injection
## 74	Sommer	Summer	16.867	3.18167	0.09	Closed slot injection
## 75	Efterår	Autumn	14.600	3.45000	0.09	Closed slot injection
## 76	Marts	March	4.900	4.02500	0.09	Trailing hose
## 77	April	April	8.500	3.91000	0.09	Trailing hose
## 78	Maj	May	12.400	3.56500	0.09	Trailing hose
## 79	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 80	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 81	Marts	March	4.900	4.02500	0.09	Trailing hose

## 82	April	April	8.500	3.91000	0.09	Trailing hose
## 83	Maj	May	12.400	3.56500	0.09	Trailing hose
## 84	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 85	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
## 86	Marts	March	4.900	4.02500	0.09	Trailing hose
## 87	April	April	8.500	3.91000	0.09	Trailing hose
## 88	Maj	May	12.400	3.56500	0.09	Trailing hose
## 89	Sommer	Summer	16.867	3.18167	0.09	Trailing hose
## 90	Efterår	Autumn	14.600	3.45000	0.09	Trailing hose
##	incorp	t.incorp	app.rate.ni	man.name	man.source	acid man.dm
## 1	None	NA	30	Svinegylle	Pig	FALSE 3.9
## 2	None	NA	30	Svinegylle	Pig	FALSE 3.9
## 3	None	NA	30	Svinegylle	Pig	FALSE 3.9
## 4	None	NA	30	Svinegylle	Pig	FALSE 3.9
## 5	None	NA	30	Svinegylle	Pig	FALSE 3.9
## 6	Shallow	4	30	Svinegylle	Pig	FALSE 3.9
## 7	Shallow	4	30	Svinegylle	Pig	FALSE 3.9
## 8	Shallow	4	30	Svinegylle	Pig	FALSE 3.9
## 9	Shallow	4	30	Svinegylle	Pig	FALSE 3.9
## 10	Shallow	4	30	Svinegylle	Pig	FALSE 3.9
## 11	Deep	4	30	Svinegylle	Pig	FALSE 3.9
## 12	Deep	4	30	Svinegylle	Pig	FALSE 3.9
## 13	Deep	4	30	Svinegylle	Pig	FALSE 3.9
## 14	Deep	4	30	Svinegylle	Pig	FALSE 3.9
## 15	Deep	4	30	Svinegylle	Pig	FALSE 3.9
## 16	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 17	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 18	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 19	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 20	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 21	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 22	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 23	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 24	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 25	None	NA	0	Svinegylle	Pig	FALSE 3.9
## 26	None	NA	30	Kvæggylle	Cattle	FALSE 6.5
## 27	None	NA	30	Kvæggylle	Cattle	FALSE 6.5
## 28	None	NA	30	Kvæggylle	Cattle	FALSE 6.5
## 29	None	NA	30	Kvæggylle	Cattle	FALSE 6.5

## 30	None	NA	30	Kvæggylle	Cattle	FALSE	6.5
## 31	Shallow	4	30	Kvæggylle	Cattle	FALSE	6.5
## 32	Shallow	4	30	Kvæggylle	Cattle	FALSE	6.5
## 33	Shallow	4	30	Kvæggylle	Cattle	FALSE	6.5
## 34	Shallow	4	30	Kvæggylle	Cattle	FALSE	6.5
## 35	Shallow	4	30	Kvæggylle	Cattle	FALSE	6.5
## 36	Deep	4	30	Kvæggylle	Cattle	FALSE	6.5
## 37	Deep	4	30	Kvæggylle	Cattle	FALSE	6.5
## 38	Deep	4	30	Kvæggylle	Cattle	FALSE	6.5
## 39	Deep	4	30	Kvæggylle	Cattle	FALSE	6.5
## 40	Deep	4	30	Kvæggylle	Cattle	FALSE	6.5
## 41	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 42	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 43	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 44	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 45	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 46	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 47	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 48	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 49	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 50	None	NA	0	Kvæggylle	Cattle	FALSE	6.5
## 51	None	NA	30	Afgasset biomasse	Digestate	FALSE	5.1
## 52	None	NA	30	Afgasset biomasse	Digestate	FALSE	5.1
## 53	None	NA	30	Afgasset biomasse	Digestate	FALSE	5.1
## 54	None	NA	30	Afgasset biomasse	Digestate	FALSE	5.1
## 55	None	NA	30	Afgasset biomasse	Digestate	FALSE	5.1
## 56	Shallow	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 57	Shallow	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 58	Shallow	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 59	Shallow	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 60	Shallow	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 61	Deep	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 62	Deep	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 63	Deep	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 64	Deep	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 65	Deep	4	30	Afgasset biomasse	Digestate	FALSE	5.1
## 66	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 67	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 68	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1

## 69	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 70	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 71	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 72	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 73	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 74	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 75	None	NA	0	Afgasset biomasse	Digestate	FALSE	5.1
## 76	None	NA	30	Svinegylle	Pig	TRUE	3.9
## 77	None	NA	30	Svinegylle	Pig	TRUE	3.9
## 78	None	NA	30	Svinegylle	Pig	TRUE	3.9
## 79	None	NA	30	Svinegylle	Pig	TRUE	3.9
## 80	None	NA	30	Svinegylle	Pig	TRUE	3.9
## 81	None	NA	30	Kvæggylle	Cattle	TRUE	6.5
## 82	None	NA	30	Kvæggylle	Cattle	TRUE	6.5
## 83	None	NA	30	Kvæggylle	Cattle	TRUE	6.5
## 84	None	NA	30	Kvæggylle	Cattle	TRUE	6.5
## 85	None	NA	30	Kvæggylle	Cattle	TRUE	6.5
## 86	None	NA	30	Afgasset biomasse	Digestate	TRUE	5.1
## 87	None	NA	30	Afgasset biomasse	Digestate	TRUE	5.1
## 88	None	NA	30	Afgasset biomasse	Digestate	TRUE	5.1
## 89	None	NA	30	Afgasset biomasse	Digestate	TRUE	5.1
## 90	None	NA	30	Afgasset biomasse	Digestate	TRUE	5.1
##	man.ph	ct	tan.app	id			
## 1	7.20	168	100	1			
## 2	7.20	168	100	2			
## 3	7.20	168	100	3			
## 4	7.20	168	100	4			
## 5	7.20	168	100	5			
## 6	7.20	168	100	6			
## 7	7.20	168	100	7			
## 8	7.20	168	100	8			
## 9	7.20	168	100	9			
## 10	7.20	168	100	10			
## 11	7.20	168	100	11			
## 12	7.20	168	100	12			
## 13	7.20	168	100	13			
## 14	7.20	168	100	14			
## 15	7.20	168	100	15			
## 16	7.20	168	100	16			

##	17	7.20	168	100	17
##	18	7.20	168	100	18
##	19	7.20	168	100	19
##	20	7.20	168	100	20
##	21	7.20	168	100	21
##	22	7.20	168	100	22
##	23	7.20	168	100	23
##	24	7.20	168	100	24
##	25	7.20	168	100	25
##	26	7.00	168	100	26
##	27	7.00	168	100	27
##	28	7.00	168	100	28
##	29	7.00	168	100	29
##	30	7.00	168	100	30
##	31	7.00	168	100	31
##	32	7.00	168	100	32
##	33	7.00	168	100	33
##	34	7.00	168	100	34
##	35	7.00	168	100	35
##	36	7.00	168	100	36
##	37	7.00	168	100	37
##	38	7.00	168	100	38
##	39	7.00	168	100	39
##	40	7.00	168	100	40
##	41	7.00	168	100	41
##	42	7.00	168	100	42
##	43	7.00	168	100	43
##	44	7.00	168	100	44
##	45	7.00	168	100	45
##	46	7.00	168	100	46
##	47	7.00	168	100	47
##	48	7.00	168	100	48
##	49	7.00	168	100	49
##	50	7.00	168	100	50
##	51	7.90	168	100	51
##	52	7.90	168	100	52
##	53	7.90	168	100	53
##	54	7.90	168	100	54
##	55	7.90	168	100	55

## 56	7.90	168	100	56
## 57	7.90	168	100	57
## 58	7.90	168	100	58
## 59	7.90	168	100	59
## 60	7.90	168	100	60
## 61	7.90	168	100	61
## 62	7.90	168	100	62
## 63	7.90	168	100	63
## 64	7.90	168	100	64
## 65	7.90	168	100	65
## 66	7.90	168	100	66
## 67	7.90	168	100	67
## 68	7.90	168	100	68
## 69	7.90	168	100	69
## 70	7.90	168	100	70
## 71	7.90	168	100	71
## 72	7.90	168	100	72
## 73	7.90	168	100	73
## 74	7.90	168	100	74
## 75	7.90	168	100	75
## 76	6.47	168	100	76
## 77	6.47	168	100	77
## 78	6.47	168	100	78
## 79	6.47	168	100	79
## 80	6.47	168	100	80
## 81	6.47	168	100	81
## 82	6.47	168	100	82
## 83	6.47	168	100	83
## 84	6.47	168	100	84
## 85	6.47	168	100	85
## 86	6.52	168	100	86
## 87	6.52	168	100	87
## 88	6.52	168	100	88
## 89	6.52	168	100	89
## 90	6.52	168	100	90

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,

## User-supplied parameters are being used.
## Incorporation applied (for group 10).
## Incorporation applied (for group 11).
## Incorporation applied (for group 12).
## Incorporation applied (for group 13).
## Incorporation applied (for group 14).
## Incorporation applied (for group 15).
## Incorporation applied (for group 31).
## Incorporation applied (for group 32).
## Incorporation applied (for group 33).
## Incorporation applied (for group 34).
## Incorporation applied (for group 35).
## Incorporation applied (for group 36).
## Incorporation applied (for group 37).
## Incorporation applied (for group 38).
## Incorporation applied (for group 39).
## Incorporation applied (for group 40).
## Incorporation applied (for group 56).
## Incorporation applied (for group 57).
## Incorporation applied (for group 58).
## Incorporation applied (for group 59).
## Incorporation applied (for group 6).
## Incorporation applied (for group 60).
## Incorporation applied (for group 61).
## Incorporation applied (for group 62).

```

```

## Incorporation applied (for group 63).
## Incorporation applied (for group 64).
## Incorporation applied (for group 65).
## 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 20 parameters. Dropped 4 with no
## These secondary parameters have been dropped:
##   app.mthd.bc.r1
##   app.mthd.ts.r1
##   ts.cereal.hght.r1
##   app.mthd.bc.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.shallow.f4
##   incorp.shallow.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  
## 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
```

```
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)
```