ALFAM2 model time of day effects

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1 Overview

The intent of this demo is see an example of time-of-day effects in the ALFAM2 model.

2 Input data

Generate input data either starting at peak air temperature and wind speed (`dat1`) or at minimum values (`dat2`). Omit other predictor variables (so use default values).

```
dat1 <- data.frame(ctime = 0:168, TAN.app = 100, man.dm = 8,
                   air.temp = 7 + 7*sin(c(0:168 + 6) * 2*pi/24),
                   wind.2m = 10 + 4*sin(c(0:168 + 6) * 2*pi/24))

dat2 <- data.frame(ctime = 0:168, TAN.app = 100, man.dm = 8,
                   air.temp = 7 + 7*sin(c(0:168 + 6 + 12) * 2*pi/24),
                   wind.2m = 10 + 4*sin(c(0:168 + 6 + 12) * 2*pi/24))

plot(air.temp ~ ctime, data = dat1, type = 'o', col = 'blue')
lines(air.temp ~ ctime, data = dat2, type = 'o', col = 'red')
```
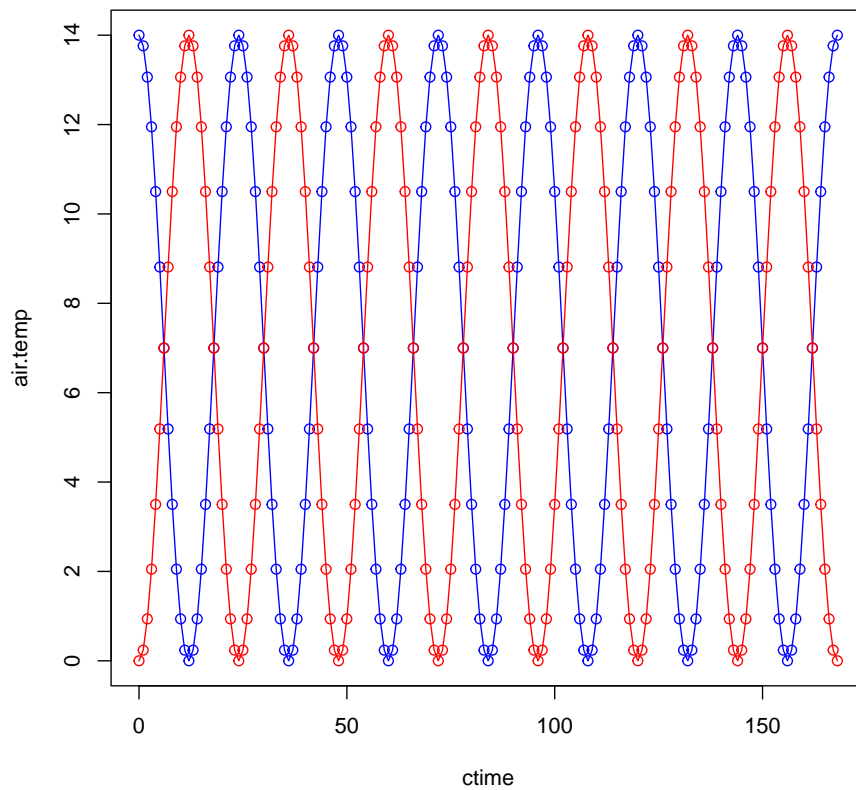
```r
plot(wind.2m ~ ctime, data = dat1, type = 'o', col = 'blue')
lines(wind.2m ~ ctime, data = dat2, type = 'o', col = 'red')
```
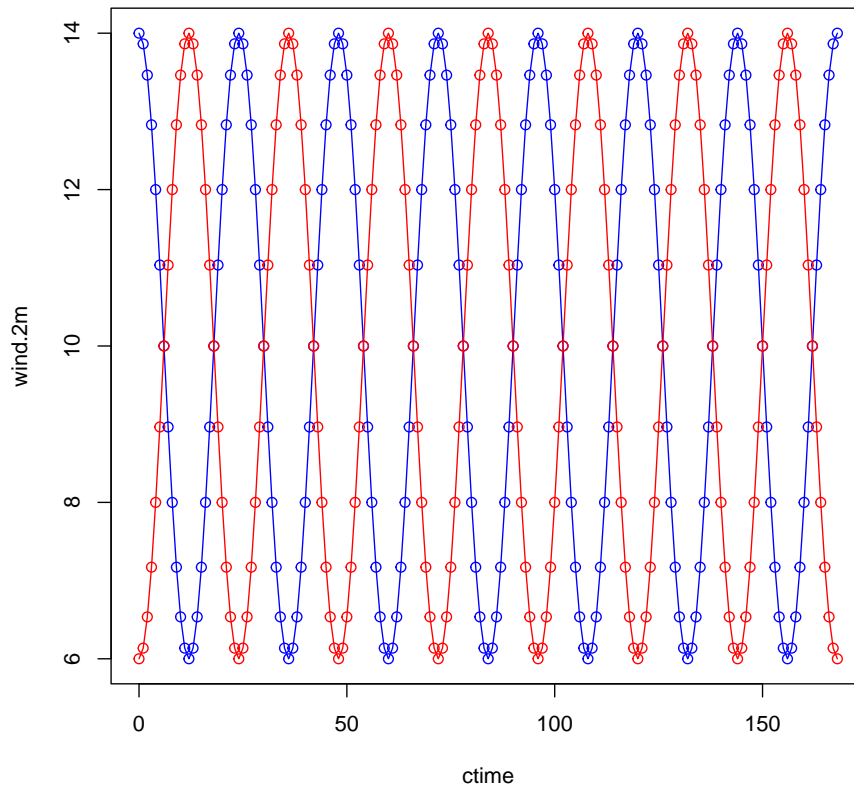
3 Model predictions

Use draft parameter set 3.

```
pred1 <- alfam2(dat1, pars = ALFAM2::alfam2pars03_alpha, app.name = 'TAN.app',
                time.name = 'ctime')

## User-supplied parameters are being used.
## Warning in prepDat(dat, value = "dummy", warn = warn): Argument
prep.dum = TRUE but there are no variables to convert to dummy variables!
##   Ignoring prep.dum = TRUE.
## Warning in alfam2(dat1, pars = ALFAM2::alfam2pars03_alpha, app.name
= "TAN.app", : Running with 8 parameters. Dropped 17 with no match.
## These secondary parameters have been dropped:
##   app.mthd.os.f0
```

```
##    app.rate.ni.f0
##    man.source.pig.f0
##    app.mthd.cs.f0
##    app.mthd.bc.r1
##    app.mthd.ts.r1
##    man.ph.r1
##    rain.rate.r2
##    app.mthd.bc.r3
##    app.mthd.cs.r3
##    man.ph.r3
##    incorp.shallow.f4
##    incorp.shallow.r3
##    incorp.deep.f4
##    incorp.deep.r3
##    rain.rate.r5
##    wind.sqrt.r1

pred2 <- alfam2(dat2, pars = ALFAM2::alfam2pars03_alpha, app.name = 'TAN.app',
                time.name = 'ctime')

## User-supplied parameters are being used.
## Warning in prepDat(dat, value = "dummy", warn = warn): Argument
prep.dum = TRUE but there are no variables to convert to dummy variables!
##    Ignoring prep.dum = TRUE.
## Warning in alfam2(dat2, pars = ALFAM2::alfam2pars03_alpha, app.name
= "TAN.app", : Running with 8 parameters. Dropped 17 with no match.
## These secondary parameters have been dropped:
##    app.mthd.os.f0
##    app.rate.ni.f0
##    man.source.pig.f0
##    app.mthd.cs.f0
##    app.mthd.bc.r1
##    app.mthd.ts.r1
##    man.ph.r1
##    rain.rate.r2
##    app.mthd.bc.r3
##    app.mthd.cs.r3
##    man.ph.r3
##    incorp.shallow.f4
##    incorp.shallow.r3
##    incorp.deep.f4
##    incorp.deep.r3
##    rain.rate.r5
##    wind.sqrt.r1
```

```r
plot(e ~ ctime, data = pred1, type = 'l', xlab = 'Time (h)',
     ylab = 'Cumulative emission (kg/ha)', col = 'blue')
lines(e ~ ctime, data = pred2, type = 'l', col = 'red')
```