Kriging example from WinBUGS:

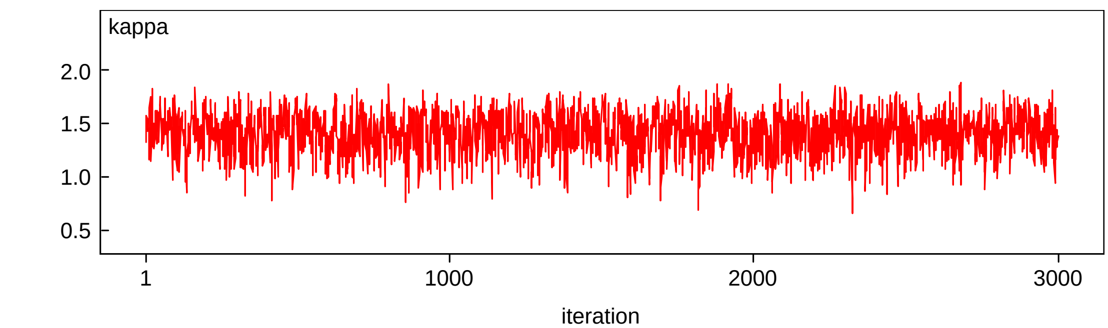
```
model {

        # Spatially structured multivariate normal likelihood
        height[1:N] ~ spatial.exp(mu[], x[], y[], tau, phi, kappa)
                                        # exponential correlation function

        for(i in 1:N) {
                mu[i] <- beta
        }

        # Priors
        beta ~ dflat()
        tau ~ dgamma(0.001, 0.001)
        sigma2 <- 1/tau

        # priors for spatial.exp parameters
        phi ~ dunif(0.05, 20)
        kappa ~ dunif(0.05,1.95)


        # Spatial prediction

        # Single site prediction
        for(j in 1:M) {
                height.pred[j] ~ spatial.unipred(beta, x.pred[j], y.pred[j],
height[])
        }

        # Only use joint prediction for small subset of points, due to
length of time it takes to run

        for(j in 1:10) { mu.pred[j] <- beta }
    height.pred.multi[1:10] ~ spatial.pred(mu.pred[], x.pred[1:10],
y.pred[1:10], height[])


}
```

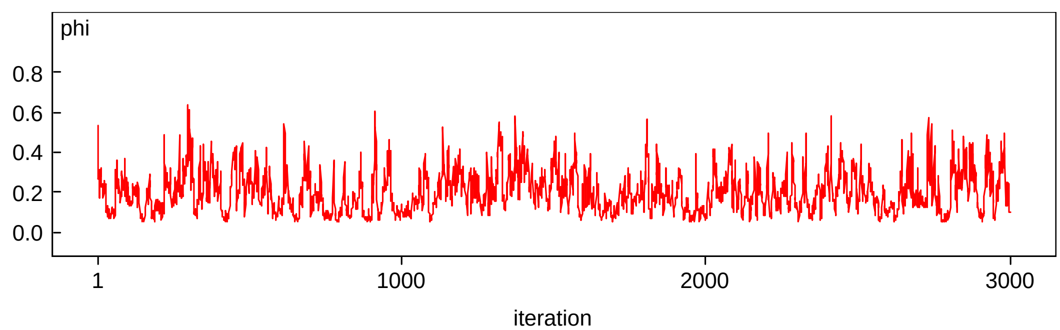
Data list(N=52, M= 225,

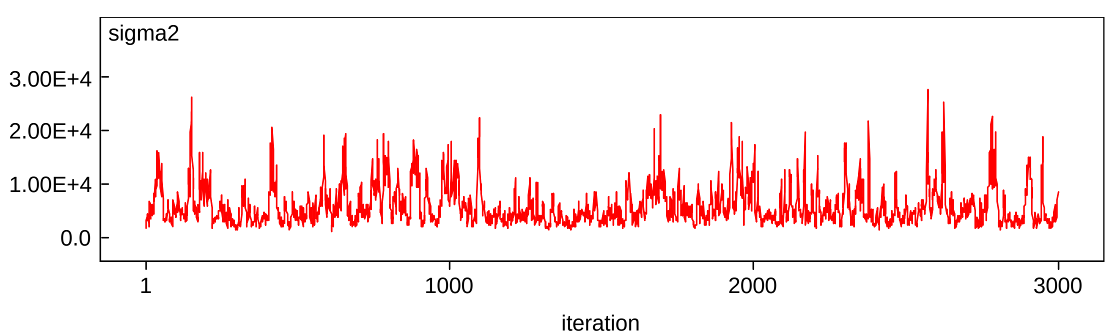
```
 x = c(0.3, 1.4, 2.4, 3.6, 5.7, 1.6, 2.9, 3.4, 3.4, 4.8, 5.3, 6.2,
       0.2, 0.9, 2.3, 2.5, 3, 3.5, 4.1, 4.9, 6.3, 0.9, 1.7, 2.4, 3.7, 4.5, 5.2,
       6.3, 0.3, 2, 3.8, 6.3, 0.6, 1.5, 2.1, 2.1, 3.1, 4.5, 5.5, 5.7, 6.2, 0.4,
       1.4, 1.4, 2.1, 2.3, 3.1, 4.1, 5.4, 6, 5.7, 3.6),
       y = c(6.1, 6.2, 6.1, 6.2, 6.2, 5.2, 5.1, 5.3, 5.7, 5.6, 5, 5.2, 4.3,
       4.2, 4.8, 4.5, 4.5, 4.5, 4.6, 4.2, 4.3, 3.2, 3.8, 3.8, 3.5, 3.2, 3.2,
       3.4, 2.4, 2.7, 2.3, 2.2, 1.7, 1.8, 1.8, 1.1, 1.1, 1.8, 1.7, 1, 1, 0.5,
       0.6, 0.1, 0.7, 0.3, 0, 0.8, 0.4, 0.1, 3, 6),
       height = c(870, 793, 755, 690, 800, 800, 730, 728,
       710, 780, 804, 855, 830, 813, 762, 765, 740, 765, 760, 790, 820, 855,
       812, 773, 812, 827, 805, 840, 890, 820, 873, 875, 873, 865, 841, 862,
       908, 855, 850, 882, 910, 940, 915, 890, 880, 870, 880, 960, 890, 860,
       830, 705),
       x.pred=c(0.21, 0.21, 0.21, 0.21, 0.21, 0.21, 0.21, 0.21, 0.21, 0.21, 0.21, 0.21, 0.21,
       0.21, 0.21, 0.63, 0.63, 0.63, 0.63, 0.63, 0.63, 0.63, 0.63, 0.63, 0.63,
       0.63, 0.63, 0.63, 0.63, 0.63, 1.05, 1.05, 1.05, 1.05, 1.05, 1.05, 1.05,
       1.05, 1.05, 1.05, 1.05, 1.05, 1.05, 1.05, 1.05, 1.47, 1.47, 1.47, 1.47,
       1.47, 1.47, 1.47, 1.47, 1.47, 1.47, 1.47, 1.47, 1.47, 1.47, 1.47, 1.89,
       1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89,
       1.89, 1.89, 2.31, 2.31, 2.31, 2.31, 2.31, 2.31, 2.31, 2.31, 2.31, 2.31,
       2.31, 2.31, 2.31, 2.31, 2.31, 2.73, 2.73, 2.73, 2.73, 2.73, 2.73, 2.73,
       2.73, 2.73, 2.73, 2.73, 2.73, 2.73, 2.73, 2.73, 3.15, 3.15, 3.15, 3.15,
       3.15, 3.15, 3.15, 3.15, 3.15, 3.15, 3.15, 3.15, 3.15, 3.15, 3.15, 3.57,
       3.57, 3.57, 3.57, 3.57, 3.57, 3.57, 3.57, 3.57, 3.57, 3.57, 3.57, 3.57,
       3.57, 3.57, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99,
       3.99, 3.99, 3.99, 3.99, 3.99, 4.41, 4.41, 4.41, 4.41, 4.41, 4.41, 4.41,
       4.41, 4.41, 4.41, 4.41, 4.41, 4.41, 4.41, 4.41, 4.83, 4.83, 4.83, 4.83,
       4.83, 4.83, 4.83, 4.83, 4.83, 4.83, 4.83, 4.83, 4.83, 4.83, 4.83, 5.25,
       5.25, 5.25, 5.25, 5.25, 5.25, 5.25, 5.25, 5.25, 5.25, 5.25, 5.25, 5.25,
       5.25, 5.25, 5.67, 5.67, 5.67, 5.67, 5.67, 5.67, 5.67, 5.67, 5.67, 5.67,
       5.67, 5.67, 5.67, 5.67, 5.67, 6.09, 6.09, 6.09, 6.09, 6.09, 6.09, 6.09,
       6.09, 6.09, 6.09, 6.09, 6.09, 6.09, 6.09, 6.09),
y.pred=c(6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31, 1.89, 1.47, 1.05,
       0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31,
       1.89, 1.47, 1.05, 0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57,
       3.15, 2.73, 2.31, 1.89, 1.47, 1.05, 0.63, 0.21, 6.09, 5.67, 5.25, 4.83,
       4.41, 3.99, 3.57, 3.15, 2.73, 2.31, 1.89, 1.47, 1.05, 0.63, 0.21, 6.09,
       5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31, 1.89, 1.47, 1.05,
       0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31,
       1.89, 1.47, 1.05, 0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57,
       3.15, 2.73, 2.31, 1.89, 1.47, 1.05, 0.63, 0.21, 6.09, 5.67, 5.25, 4.83,
       4.41, 3.99, 3.57, 3.15, 2.73, 2.31, 1.89, 1.47, 1.05, 0.63, 0.21, 6.09,
       5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31, 1.89, 1.47, 1.05,
       0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31,
       1.89, 1.47, 1.05, 0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57,
       3.15, 2.73, 2.31, 1.89, 1.47, 1.05, 0.63, 0.21, 6.09, 5.67, 5.25, 4.83,
       4.41, 3.99, 3.57, 3.15, 2.73, 2.31, 1.89, 1.47, 1.05, 0.63, 0.21, 6.09,
       5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31, 1.89, 1.47, 1.05,
       0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57, 3.15, 2.73, 2.31,
       1.89, 1.47, 1.05, 0.63, 0.21, 6.09, 5.67, 5.25, 4.83, 4.41, 3.99, 3.57,
       3.15, 2.73, 2.31, 1.89, 1.47, 1.05, 0.63, 0.21))
```

Posterior distributions of model parameters:

Parameter	Mean	Std	2.5th perc	97.5th perc.
beta	857.4	47.51	771.8	965.2
phi	0.199	0.101	0.060	0.432
kappa	1.408	0.202	0.978	1.755
Sigma^2	5,805	3,601	1,959	15,300







Posterior predicted distributions for elevations at new sites

height.pred[1]	872.2	7.512	0.1462	856.4	872.3	887.0	501	2500
height.pred[2]	861.6	19.3	0.3669	823.6	861.5	899.5	501	2500
height.pred[3]	849.9	22.71	0.387	804.3	849.4	895.1	501	2500
height.pred[4]	837.0	20.25	0.3898	797.7	837.0	877.6	501	2500
height.pred[5]	829.9	8.429	0.1921	812.9	829.9	846.9	501	2500
height.pred[6]	836.5	15.0	0.3019	806.1	836.3	866.0	501	2500
height.pred[7]	853.7	20.94	0.459	814.3	853.1	895.7	501	2500
height.pred[8]	869.8	20.22	0.4546	828.7	870.0	909.7	501	2500
height.pred[9]	883.7	15.81	0.2907	852.3	883.9	913.1	501	2500
height.pred[10]	891.4	9.168	0.1985	872.8	891.5	909.5	501	2500
height.pred[11]	888.1	16.1	0.3183	856.2	887.6	921.0	501	2500
height.pred[12]	896.0	18.74	0.4204	859.0	896.0	933.1	501	2500
height.pred[13]	917.4	19.36	0.453	880.1	917.3	955.3	501	2500
height.pred[14]	935.6	13.39	0.3311	907.2	935.7	961.4	501	2500
height.pred[15]	936.1	18.35	0.3926	899.3	935.9	973.0	501	2500
height.pred[16]	848.3	14.1	0.3106	820.1	848.7	875.1	501	2500
height.pred[17]	843.8	19.39	0.3594	807.3	844.2	881.8	501	2500
height.pred[18]	834.7	22.18	0.4178	788.8	835.2	876.8	501	2500
height.pred[19]	826.4	20.07	0.3427	788.0	826.7	864.7	501	2500
height.pred[20]	818.7	13.26	0.2271	792.5	818.6	845.0	501	2500
height.pred[21]	826.2	13.66	0.3039	798.7	826.2	852.5	501	2500
height.pred[22]	844.5	15.75	0.353	813.0	844.6	876.0	501	2500
height.pred[23]	862.5	13.79	0.2909	834.1	862.8	889.3	501	2500
height.pred[24]	873.7	14.93	0.3235	843.7	873.9	902.6	501	2500
height.pred[25]	877.2	13.9	0.2796	850.8	876.9	905.2	501	2500