Help file for the spatial quantile regression approach of


This *R* code does not include temporal dependence but does account for spatial dependence using a Gaussian copula (Appendix A.1). The main function is `Spatial_QR`, which is described below.

**Inputs**

- `y` #times x #sites matrix of responses.
- `s` #sites x 2 matrix of spatial locations.
- `X` #times x #sites x #predictors covariate array. $X[j,t,k]$ is the kth predictor at location $s[j,]$ at time t. $X[,,1]$ must be one for the intercept. All elements of X must be between 0 and 1.
- `L` Number of basis functions in the quantile function. Should be even.
- `mn_range` Spatial ranges (phi and rho) have log(range)$\sim$N(mn_range,sd_range) priors.
- `sd_range` Variances (tau and delta) have var$\sim$InvGamma(a_var,b_var) priors.
- `a_var` Mean parameters (theta-bar and beta-bar) have N(0,sd_mean) priors.
- `b_var` Number of MCMC samples to generate.
- `burn` Number of samples to discard as burn-in.
- `update` Frequency of progress updates.
- `tau` Vector of quantile levels for which the results are reported.

**Outputs**

- `qfx.mn` Posterior mean of the quantile function. $qfx.mn[j,k,l]$ is the value for quantile level $tau[j]$, covariate $k$, and spatial location $s[l,]$.
- `qfx.var` Posterior variance of the quantile function. $qfx.var[j,k,l]$ is the value for quantile level $tau[j]$, covariate $k$, and spatial location $s[l,]$.
- `qfx.prob.g.0` Posterior probability that the quantile function is greater than zero. $qfx.prob.g.0[j,k,l]$ is the value for quantile level $tau[j]$, covariate $k$, and spatial location $s[l,]$.
- `range` Posterior samples of the spatial range of theta and beta.
- `range_res` Posterior samples of the spatial range of the residuals (in the copula).
- `theta` Posterior samples of theta. $theta[i,j,k,l]$ is the value for iteration $i$, covariate $j$, location $k$, and basis function $l$.
- `beta` Posterior samples of beta. $beta[i,j,k]$ is the value for iteration $i$, covariate $j$, and location $k$. 