Global oceanic barrier model on the sphere

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Introduction

In this tutorial, we illustrate the implementation of the barrier model proposed in Bakka et al. (2019) in the sphere. It considers the problem of modeling over a spatial domain, taking into account physical barriers and the spherical shape of the Earth. Since we are working on the global oceans, continents can be considered as physical barriers, and this aspect has to be taken into account in the modeling. When using a barrier model, the range is not only determined by the distance to points. If there is a barrier between two points, the range should decrease quickly, and the correlation over the barrier should approach zero. Additionally, the Earth's spherical shape is a crucial factor in this particular case, as considering a planar approximation can bias the results when working on a global scale. Therefore, this tutorial is developed using a projection onto a sphere. We are using the new implementation of the INLA package.

Since the compiled vignette is large is size, we do not include it the R-INLA package, but you can download the vignette source and downloaded data, at "https://github.com/hrue/r-inla/tree/devel/rinla/vignettes/barrier-global'' and compile it yourself.

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