1 | Random Fields

A random field is a stochastic process within Euclidean space and with dimensionality > 1. What's a stochastic process? Note that T is a traditional Euclidean space like a cube. *DEFINITION* A stochastic process f over T is a collection of random variables $\{f(t) : t \in T\}$. *DEFINITION* If T is a set of dimension N, and the random variables $f(t)$ are all vector valued of dimension d, then we call the vector valued random field f a (N, d) random field.

An intuitive example of a random field is the ocean surface.

2 | Gaussian Random Fields

2.1 | Gaussian Variables

A random variable is Gaussian if its density distribution is a Normal distribution. Let's leave it at that. [Note to future self: Math is hard!]

2.2 | Gaussian Fields

3 | Generation

Combination of last two sources may enable some amount of info to go off of.

4 | Useful Sources

- `http://pages.stat.wisc.edu/~mchung/teaching/stat992/ima01.pdf`

Describes basic definitions.

- `https://www.astro.rug.nl/~weygaert/tim1publication/lss2007/computerIII.pdf`

Mentions Fourier space generation

- `https://www.astro.rug.nl/~weygaert/tim1publication/lss2016/lss2016.gaussian_fields.handout2.pdf`

Cosmology-focused source + goes into some detail on power spectra and fourier space.