# Introduction to Gaussian process with inequality constraints, Application to coast flooding risk

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**Résumé**

In Gaussian process modeling, inequality constraints enable to take expert knowledge into account and thus to improve prediction and uncertainty quantification. Typical examples are when a black-box function is bounded or monotonic with respect to some of its input variables. We will show how inequality constraints impact the Gaussian process model, the computation of its posterior distribution and the estimation of its covariance parameters. An example will be presented, where a numerical flooding model is monotonic with respect to two input variables called tide and surge.

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