"Semiparametric estimation of shifts and dilatation."

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We consider the regression model :

$$Y_{i,j} = a_j^* f(\theta_j - t_i) + \epsilon_{i,j},\ i = 1 \dots n,\ j = 1 \dots J.$$

Where :

- f is an unknown real valued fonction defined on a compact group $(\mathbb{G}, +)$.
- (t_i) is a sequence of $\mathbb{G}$.
- the parameter $a^* = (a_j^*) \in \mathbb{R}^J$ and $\theta^* = (\theta_j^*) \in \mathbb{G}^J$ are unknown.
- $(\epsilon_{i,j})$ is a white noise.

We need to estimate a^* et θ^*, without any information on f. In order to do this, we build a contrast processus based on a basis of eigenvector of the translation and dilatation operators.

This problem generalizes the study in the article of F.GAMBOA, J.M.LOUBES, E.MAZA "semi-parametric estimation of schift" (submitted in 2004) on the one dimensional torus. In this work, we estimate in the same time the dilatation and translation, and the basis of eigenvector is the Fourier's basis.