

# RÉSUMÉS

## VOLUME 70

I. Z. WOJTKOWIAK, *Periods of mixed Tate motives, examples,  $l$ -adic side*. One hopes that the  $\mathbb{Q}$ -algebra of periods of mixed Tate motives over  $\text{Spec}\mathbb{Z}$  is generated by values of iterated integrals on  $\mathbb{P}^1(\mathbb{C}) \setminus \{0, 1, \infty\}$  in one forms  $\frac{dz}{z}$  and  $\frac{dz}{z-1}$  from  $\vec{01}$  to  $\vec{10}$ . These numbers are also called multi zeta values. In this note we give a sketch of a proof, assuming motivic formalism, that the  $\mathbb{Q}$ -algebra of periods of mixed Tate motives over  $\text{Spec}\mathbb{Z}$  is generated by linear combinations with rational coefficients of iterated integrals on  $\mathbb{P}^1(\mathbb{C}) \setminus \{0, 1, -1, \infty\}$  in one forms  $\frac{dz}{z}$ ,  $\frac{dz}{z-1}$  and  $\frac{dz}{z+1}$  from  $\vec{01}$  to  $\vec{10}$ , which are unramified everywhere. We shall discuss also  $l$ -adic analog of this result and also some other examples.

II. D. DENIS, *Facteurs communs et torsion en caractéristique non nulle*. Le pgcd des quantités  $a^n - 1$  et  $b^n - 1$  a été étudié dans des cadres variés. Dans la première partie de cet article nous montrerons que si  $a$  et  $b$  sont dans  $\mathbb{F}_q[T]$ , il existe des situations où le pgcd est borné indépendamment de l'entier  $n$ , répondant en cela à une question de J. Silverman. Dans une seconde partie nous examinerons un problème analogue en liaison avec les modules de Drinfeld

III. C. BIERNACKI, J. JACQUES, *A generative model for rank data based on sorting algorithm*. Rank data arise from a sorting mechanism which is generally unobservable for the statistician. Retaining the insertion sorting algorithm because of its well known optimality properties and combining it with a natural stochastic error in the pair comparison process allows to propose a parsimonious and meaningful parametric generative model for rank data. Its theoretical properties are studied like unimodality, symmetry and identifiability. In addition, maximum likelihood principle can be easily performed through an EM algorithm thanks to an unobserved latent variables interpretation of the model. Finally, an illustration of adequacy between the proposed model and rank data resulting from a general knowledge quiz suggests the relevance of our proposal.

IV. D. COUPIER, P. HEINRICH, *Stochastic domination for the last passage percolation model*. A competition model on  $\mathbb{Z}_+^2$  governed by directed last passage percolation is considered. A stochastic domination argument between subtrees of the last passage percolation tree is put forward.

V. A. RAČKAUSKAS, Ch. SUQUET, *Operator fractional Brownian motion as limit of polygonal line processes in Hilbert space*. In this paper we study long memory phenomenon of functional time series. We consider an operator fractional Brownian motion with values in a Hilbert space defined via operator valued Hurst coefficient. We prove that this process is a limiting one for polygonal lines constructed from partial sums of time series having space varying long

memory.

VI. X. BROSSAT, G. OPPENHEIM, M.-C. VIANO, *Estimating and forecasting partially linear models with periodic covariances*. This paper presents a backfitting-type method to estimate and forecast a periodically correlated partially linear model with exogeneous variables and heteroskedastic input noise. A rate of convergence of the estimator is given. The results are valid even if the period is unknown.

VII. A. LOURME, C. BIERNACKI, *Simultaneous Gaussian model-based clustering for samples of multiple origins*. Mixture model-based clustering usually assumes that the data arise from a mixture population in order to estimate some hypothetical underlying partition of the dataset. In this work, we are interested in the case where several samples have to be clustered at the same time, that is when the data arise not only from one but possibly from several mixtures. In the multinormal context, we establish a linear stochastic link between the components of the mixtures which enables the joint-estimate of their parameters—estimations are performed here by maximum likelihood—and the simultaneous classification of the diverse samples. We propose several useful models of constraint on this stochastic link, and we give their parameter estimators. The interest of these models is highlighted in a biological context where some birds belonging to several species have to be classified according to their sex. We show firstly that our simultaneous clustering method does improve the partition obtained by clustering independently each sample. We then show that this method is also efficient in assessing the cluster number when assuming it is unknown. Finally some additional experiments are performed to show the robustness of our simultaneous clustering method when one of its main assumptions is relaxed.

VIII. Ch. BOUYEYRON, J. JACQUES, *Adaptive mixtures of regressions: improving predictive inference when population has changed*. When regression is carried out in a prediction purpose, one of the main assumptions is the absence of evolution in the modeled phenomenon between the training and the prediction stages. Unfortunately, this assumption turns out to be often false in practical situations. The present work investigates the estimation of regression mixtures when population has changed between the training and the prediction stages. The main idea of this work is to link the regression mixture of the prediction population with the known regression mixture of the training population. For this, two approaches are suggested. On the one hand, a parametric approach modeling the relationship between dependent variables of both populations is presented and the EM algorithm is used for the parameters estimation. On the other hand, a Bayesian approach is also proposed in which the priors on the prediction population depend on the mixture regression parameters of the training population. In this latter case, a MCMC procedure is used for inference. The relevance of both the parametric and the Bayesian approaches is illustrated on simulations and then compared to classical strategies on an environmental dataset.

IX. A. RAČKAUSKAS, Ch. SUQUET, *Functional central limit theorems for self-normalized partial sums of linear processes*. We prove the invariance principle under self-normalization by blocks for linear processes with summable filters and i.i.d. innovations in the domain of attraction of the normal distribution.