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Stochastic qualifyers of brain dynamics JENS PRUSSEIT, Helmholtz Institute for Radiation and Nuclear Physics, University of Bonn, KLAUS LEHNERTZ, Department of Epileptology, University of Bonn — Despite the fact that both linear and nonlinear analyses of EEG time series have provided valuable insights into the complex spatio-temporal dynamics of physiological and patho-physiological brain functions, these processes are far from being fully understood. We here investigate the applicability of a previously proposed analysis method to characterize EEG time series from epilepsy patients using concepts from the theory of Markov-processes. To estimate the coefficients of a corresponding Fokker-Planck equation we adopt the method of Siegert et al (Phys. Lett. A **243**, 275 (1998)) to the problem at hand. To check the validity of our approach we reconstruct the driving noise force via the associated Langevin equation and show that the noise is approximately delta-correlated and Gaussian. We then integrate our model to compare the stationary probability distribution function (PDF) as well as the conditional PDFs on different time scales with the PDFs derived from the EEG data. Applying the analysis method to long-lasting multichannel EEG recordings we discuss the possible relevance for diagnostic purposes.

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