Objectives and main results: The project sought to improve the statistical methods used in detection and attribution of climate changes (D&A). The application of the Regularised Optimal Fingerprinting (ROF) to global temperature observations and CMIP5 simulations has strengthened the recent human influence on climate, but at the same time has further underlined the difficulty to discriminate between the greenhouse gas and aerosols forcings. These diagnostics contributed to the IPCC AR5 D&A statement. The statistical inference within the error-in-variables (EIV) model has been revised, with the introduction of a suitable maximum likelihood method. Discussions initiated on this statistical model, regarding e.g. a potential Bayesian treatment, or the use of non-asymptotical methods to infer confidence intervals, may likely lead to additional publications in the near future.

Some other statistical issues have been tackled. Among these, the estimation of a covariance matrix in large dimension, which is a key issue both in D&A and climate sciences in general, has been studied, with the introduction of a Gaussian conjugate framework.

Future of the project: This project has initiated new collaborations within the national community, which may be expected to continue in the long-term. Several lines of research initiated by the project will be pursued in the short-term, and additional publication(s) may be expected, e.g. regarding the application of the proposed methods. Some of the remaining scientific concerns are also tackled in two recent proposals.

4 publications (2 submitted), 7 communications


