Non technical description

With the widespread use of satellite imaging, a wealth of information is available to help in the understanding and modeling of earth system processes. In particular, these data play a key role in the analysis of climate variability. However, satellite-based retrievals present spatial discontinuities due to incomplete coverage of the domain resulting from satellite orbital characteristics, or through occlusion by cloud cover and other atmospheric effects. The straightforward use of Geostatistical prediction methods is made impossible by the wealth of the datasets at stake. Indeed, while the traditional domains of application of Geostatistics (mining and petroleum engineering) provided relatively small spatial datasets, remote sensing applications generate large spatiotemporal datasets. Dealing with “big data” is becoming an increasingly important topic in many areas of applied science and engineering, in particular in climate studies. The wealth of such datasets allows for ambitious modeling, including complex relationships between variables and irregular behaviour over space and/or time that are challenging to modern Geostatistics. The purpose of this project is to develop such models as well as adapted inference and prediction methods for an application to remote sensing data.