Scope of the study
Flash flood forecasting has major economic and social issues. Funded by the French National Flood Warning and Forecasting Service (SCHAPI), the objective of this study is to better understanding the Lez karst hydrosystem behaviour during flash flooding.

Karst systems
- Results from hydrochemical and hydraulic erosion of soluble rock
- Strongly heterogeneous structure
- Anisotropic water circulation
- Nonlinear behaviour, difficult to model and forecast

From natural system to neural network model

Knowledge eXtraction method
- Neural networks are used for their fundamental properties of universal approximation and parsimony
- After training, parameters are analyzed to assess the contribution of each input to the output

Spatialized contributions

Rainfalls contributions

Conclusions
- Southwestern zone is the main contributor
- Northeastern and southwestern zones show two peaks of contribution
- First (fast) peaks are attributed to the surface runoff
- Second (slower) peaks are attributed to the karst
- Northwestern zone can be excluded from forecasting model

Perspectives
- Contributions provide valuable information
- Humidity conditions prior the event are particularly relevant to be assessed in the southwestern zone
- This improved knowledge can be introduced into neural network forecasting model to enhance its performances

References
Kong A Siou, L.: Modélisation des crues de bassins karstiques par réseaux de neurones. Cas du bassin du Lez (France), Université Montpellier II-Sciences et Techniques du Languedoc, 2011.