How to detect characteristic features of hydrology?

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The monthly solutions for the time-variable gravity field resulting from the GRACE mission are already corrected for the influence of atmospheric and oceanic masses. Hence, the main component contained in them is due to variations of continental hydrological storage. However, since the atmospheric and oceanic models are not perfect and some other influences, like the changes of ice shields, are not included at all, the temporal gravity field variations deduced from GRACE monthly solutions contain all model deficiencies of the used physical models and also all unmodelled effects. In order to use these temporal gravity field variations for the improvement of the global hydrological modelling it is necessary to separate signals arising from different sources.

Several global hydrological models have been compared, both in the space and in the frequency domains. It turned out that they differ considerably and none of them can be considered as a good representation of the real hydrological variations.

However, it can be supposed that the characteristic features contained in all considered models can be attributed to real hydrological variations. In order to make a first step towards the detection of characteristics of the hydrological variations, the considered global hydrological models have been analyzed using different techniques, like EOF (Empirical Orthogonal Functions). The results have been compared and the common characteristics are discussed.