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# Catchment characterisation through Streamflow Component mixing Approach

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A simple dynamical system approach was implemented in order to analyse, explain and simulate streamflow fluxes in diverse seasonal hydrological conditions. The study was implemented within 42 km2 forested Padež stream catchment in SW part of Slovenia, which is characterized by flushing, almost torrential hydrological response conditioned by flysch geological settings of low hydraulic conductivity. The hydrological characteristics of the studied catchment at first sight do not comply with the hydrological catchment storage framework in which original concept of the catchment as a simple dynamical system was developed. In the studied catchment, the streamflow formation is not controlled solely by subsurface catchment storage but is strongly influenced also by rainfall runoff that bypasses the subsurface catchment storage mechanism. Therefore, two components of the streamflow were identified, described by separate sensitivity functions and combined through simple two component mixing model which enabled us simulation of the streamflow in highly contrasting seasonal hydrological settings. According to the simulation results, the Padež stream catchment behaves primarily like a storage-dependent system under conditions of low antecedent catchment wetness and low to moderate rainfall intensities (up to 5 mm/h) when subsurface storage sensitivity function generally managed to simulate streamflows with exception of hydrograph peak formation. When rainfall intensities increase (exceed approximately 5 mm/h), secondary streamflow formation mechanism described by subsurface storage bypassing sensitivity function becomes initiated and causes fast hydrograph formation with steeply rising and falling limbs. In order to be able to implement the modelling concept for streamflow predictions, the rainfall losses in growth period, most probably associated with interception losses not covered under the potential evapotranspiration calculation, would have to be more thoroughly analysed. Our study shows a possible way how two hydrological concepts, the streamflow recession analysis and two component mixing based on relatively easily measurable conservative tracers such as electrical conductivity could be combined for analysing streamflow fluxes.