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Is there a Tectonic Control of Drainage Systems in the European Alps? - A Numerical Approach

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Based on a new numerical model that couples a thin viscous sheet code for large strains and discrete faults and a model for fluvial erosion based on Hack's formulation we present some food for thought about the tectonic control of major drainage systems in the Eastern Alps. In detail we discuss influence of strike slip faults, uplift and orogen parallel extension on river catchments. Beside a tectonic control, we also focus on the possible impact of the Messinian salinity crisis on river networks south of the Alps that drain into the Adriatic Sea.

We therefore compare measured river profiles and network parameters of several major alpine rivers (e.g. Salzach, Enns, Drau) with their modelled counterparts. A variety of parameters is chosen to get end member scenarios that allow us to give ballpark estimates on the tectonic control of the alpine drainage systems.