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Sinuosity change of the Po River near Cremona (Northern Italy) – a result of neotectonic activity?

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In the map sheets of the Second Military Survey of the Habsburg Empire, Lombardia, Parma, Modena and Venice also can be seen (Timár et al., 2006). This area was surveyed between 1818 and 1829. In these map sheets, we can also follow the river Po from Vaccarizza to the delta. This river reach is about 350 km long.

This river reach was digitized and sinuosity values were calculated with different window sizes, and displayed in a spectrum-like diagram (sinuosity spectra; after van Balen et al., 2008). At Cremona, a significante sinuosity change were identified. The sinuosity increasing, and we have high sinuosity values. In the summarizing geological map of Italy (Compagnoni and Calluzzo, 2004), at this place, a tectonic line was identified. So probably this fault line invokes the sinuosity change on the river.

The vertical movements indicated on the maps are just the opposite like they would be according to the flume experiments of Ouchi (1985). In the case of the Po River at Cremona, the decrease of the channel slope results higher sinuosity. The reason is that the rate of the slope and water discharge is higher than it is required by the self-organized meandering and the river parameters fell to the range of the unorganized meandering (cf. Timár, 2003). Another possible explanation could be that the northern tributary, the Adda River has significant sediment load that lowers the sinuosity of the trunk river at the confluence.

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