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## Development of a processing chain of multispectral Sentinel-2 data to extract meandering river courses for geomorphometric analysis in Central Amazonia Region

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Freely-meandering rivers are sensitive indicators of neotectonic activity that is otherwise difficult to detect in low-relief areas. In this study sinuosity analysis has been carried out on 20 main rivers and tributaries of Central Amazonia Region as an aid for localization of river channel patterns influenced by on-going tectonic activity.

The main problem of such studies, however, the availability of accurate river channel data. For the Central Amazonia Region highly accurate dataset that has a good geographical coverage is hardly available: the datasets we found did not fulfill the accuracy criteria for our project.

Consequently, the first objective of this project was to develop a data processing method of high resolution satellite images which provides a quick and accurate way to digitize river sections of a large parts of the intracratonic sedimentary basin. Furthermore, this work aims to detect channel sinuosity changes that could indicate recent vertical crustal movements. To achieve this, the water courses were automatically digitized using Sentinel-2 data and classic sinuosity values were calculated using several window sizes. The distribution of sinuosity variations was analysed by classification and various representations of the calculated values like mapping, crossplots and sinuosity-spectrum.

As the visualization methods complement each other the variations in sinuosity values can be highlighted and verified in several aspects. The results compared to former neotectonic studies some significant sinuosity changes can be correlated to known faults. The mentioned sinuosity variations coincides with the location of NW-SE normal and thrust faults active since Pleistocene times and NE-SW Miocene normal faults supporting the idea that these structures may have been reactivated.

In conclusion, multi-window sinuosity index calculation applied to satellite data based digitized water courses is a useful tool for recognizing recent tectonic activity in large low-relief areas, such as Central Amazonia.

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