

A new automatic calibration approach based on rating curves: first results with ENVISAT altimetric data

AUGUSTO C. V. GETIRANA

LEGOS, UPS-Toulouse 3, IRD, Toulouse, France

augusto.getirana@legos.obs-mip.fr

Abstract This study presents preliminary results obtained with a new procedure for the automatic calibration of hydrological models based exclusively on spatial altimetry data. The technique is based on the minimization of biases between discharges computed by the hydrological model and by stage *versus* discharge relationships ($h \times Q$ model) derived from the combination of spatial altimetry data and modelled discharges at virtual stations. The study area is the Branco River basin, located in the northern Amazon basin. Spatial altimetry data provided by the ENVISAT satellite at four virtual stations are used in the optimization process for the 2002–2006 periods. For altimetry-based cases, the Nash-Sutcliffe (NS) coefficient varied from 0.66 to 0.94, the NS for the logarithms of streamflows from 0.61 to 0.95 and the relative error (RE) from 0.18 to 0.73. The best values for discharge-based cases were 0.94, 0.96 and 0.16, respectively. The results show that the new altimetry-based optimization approach can provide improved solutions and reliably reproduce discharges time series. It also gives results similar to those provided by discharge-based optimization approaches, with competitive computational costs.

Key words automatic calibration; spatial altimetry; hydrological modelling; rating curve