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ADCP with onboard GPS for streamflow velocity measurement usable for physical models calibration

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Human beings always wanted to protect themselves from hazards associated with rivers and streams. Whether we talk about low flow, pollution or flooding, streams very quickly interested scientists and engineers for their wealth and abilities.

EDF (Electricit e de France) is a french company dealing with energy production. Dealer or owner operator of electricity production structures, the company is responsible for their operation in safe conditions. Thus, the knowledge of parameters such as streamflow discharge or streamflow velocities is one of its priorities to better respond to three key issues which are plant safety, compliance with regulatory requirements and optimization of the means of production.

The present work consists in showing how to use ADCP (Acoustic Doppler Current Profiler) to accurately measure streamflow velocities in complicated conditions (tide cycle, complex flow, bubbles, factory in operation...). Such device can be coupled with GPS to precisely geolocalize the measured velocities to make them usable for models calibration. By showing a case study, this work aims at underlining how field work using ADCP with onboard GPS can create input data for the adaptation and the calibration of physical models.