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## **Hydrometry — Measuring river velocity and discharge with acoustic Doppler profilers**

*Hydrométrie — Mesure de la vitesse et du débit des rivières au moyen  
de profileurs à effet Doppler*



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Published in Switzerland

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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ISO/TS 24154 was prepared by Technical Committee ISO/TC 113, *Hydrometry*, Subcommittee SC 5, *Instruments, equipment and data management*.

# Hydrometry — Measuring river velocity and discharge with acoustic Doppler profilers

## 1 Scope

Acoustic Doppler profilers are instruments and software packages used to measure water velocity, channel bathymetry, and river discharge. This Technical Specification gives the principles of operation, construction, maintenance and application of acoustic Doppler profilers to the measurement of velocity and discharge, and discusses calibration and verification issues. It is applicable to open-channel flow measurements with an instrument mounted on a moving vessel.

It is not applicable to measurement of liquid flow in small channels or partly-filled pipes using a single Doppler-based flowmeter at a fixed point in the cross section.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 772, *Hydrometric determinations — Vocabulary and symbols*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 772 and the following apply.

### 3.1

#### **Doppler shift**

⟨general⟩ change in frequency of a sound source as it approaches and recedes from an observer

### 3.2

#### **Doppler shift**

⟨acoustic Doppler instruments⟩ difference or shift in frequency of emitted sound waves as they are reflected back from moving particles in the water

### 3.3

#### **Doppler-based flowmeter**

class of instruments that uses the principle of Doppler shift to compute water velocity and discharge

NOTE These instruments can be deployed at a fixed point in a cross section or on a moving vessel.

### 3.4

#### **acoustic Doppler profiler**

##### **ADP**

instrument that uses the principle of Doppler shift to compute water velocity and discharge

NOTE The instrument is usually mounted on a vessel that transits across a river channel perpendicular to flow.