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Hydrometry — Acoustic Doppler profiler — Method and application for measurement of flow in open channels from a moving boat

Hydrométrie — Profileurs acoustiques à effet Doppler — Méthode et application pour le mesurage de l'écoulement à surface libre sur un bateau mobile

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 113 *Hydrometry*, Subcommittee SC 1 *Velocity area methods*.

This first edition of ISO 24578 cancels and replaces ISO/TR 24578:2021, which has been technically revised.

The main changes compared to the previous edition are as follows:

— the title has been modified to read "Hydrometry — Acoustic Doppler profiler — Method and application for measurement of flow in open channels from a moving boat".

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The term acoustic Doppler current profilers (ADCP) has been adopted as a generic term for a technology that is manufactured by various companies worldwide. They are also called acoustic Doppler velocity profilers (ADVPs) or acoustic Doppler profilers (ADPs).

To use this document effectively, it is essential that users are familiar with the terminology and functions of their own ADCP equipment. Users should also be familiar with additional requirements.

Hydrometry — Acoustic Doppler profiler — Method and application for measurement of flow in open channels from a moving boat

1 Scope

This document gives guidelines for the use of boat-mounted acoustic Doppler current profilers (ADCPs) for determining flow in open channels. It describes a number of methods of deploying ADCPs to determine flow. Although, in some cases, these measurements are intended to determine the stage-discharge relationship of a gauging station, this document deals only with single determination of discharge.

ADCPs can be used to measure a variety of parameters, such as current or stream flow, water velocity fields, and channel bathymetry. As a potential application, an idea of bedload discharge can be obtained applying the bottom track velocity, while suspended sediment flow can be obtained applying the acoustic backscatter and the sonar equation. This document is generic in form and contains no operational details specific to particular ADCP makes and models.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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, *Hydrometry — 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.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
transducer depth
ADCP depth
draft
depth of the ADCP transducers below the water surface during *deployment* (3.6)

Note 1 to entry: The ADCP depth should be measured manually.

3.2
bin
depth cell
truncated cone-shaped volume of water at a known distance and orientation from the transducers

Note 1 to entry: The ADCP determines an estimated velocity for each cell using a centre-weighted averaging scheme, which takes account of the water not only in the bin itself but also in the two adjacent bins.