

1. Record Nr.	UNINA9910427735403321
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Titolo	Mesoscale Analysis of Hydraulics // by Weilin Xu
Pubbl/distr/stampa	Springer Nature, 2021 Singapore : , : Springer Singapore : , : Imprint : Springer, , 2021
ISBN	981-15-9785-5
Edizione	[1st ed. 2021.]
Descrizione fisica	1 online resource (XVIII, 239 p. 205 illus., 144 illus. in color.)
Disciplina	624.15
Soggetti	Engineering geology Engineering—Geology Foundations Hydraulics Civil engineering Mechanical engineering Geoengineering, Foundations, Hydraulics Civil Engineering Mechanical Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Mesoscale analysis of cavitation and cavitation erosion -- Mesoscale analysis of aeration for cavitation erosion protection -- Mesoscale analysis of air-water two-phase flow -- Mesoscale analysis of flood discharge and energy dissipation .
Sommario/riassunto	This open access book presents a series of complicated hydraulic phenomena and related mechanism of high-speed flows in head-head dam. According to the basic hydraulic theory, detailed experiments and numerical simulations, microscopic scale analysis on cavitation bubbles, air bubbles, turbulent eddy vortices and sand grains are examined systemically. These investigations on microscopic fluid mechanics, including cavitation erosion, aeration protection, air–water flow, energy dissipation and river-bed scouring, allow a deep understanding of hydraulics in high-head dams. This book provides reference for designers and researchers in hydraulic engineering,

