PROCEEDINGS OF EUROMECH 192 / TRANSPORT OF SUSPENDED SOLIDS IN OPEN CHANNELS / MUNICH / NEUBIBERG / 11-15 JUNE 1985

## Transport of Suspended Solids in Open Channels

Edited by W.BECHTELER

Institute for Hydromechanics, University of the Armed Forces, Munich/Neubiberg, FR Germany



A.A.BALKEMA/ROTTERDAM/BOSTON/1986



Euromech 192: Transport of Suspended Solids in Open Channels / Neubiberg / 11-15 June 1985

## Table of contents

Preface	IX
1 Flow structures as related to suspended sediment transport, particle-fluid dynamics	
Recent developments on the mechanics of sediment suspension B.Mutlu Sumer	3
Effects of suspended sediment on open channel velocity distributions Neil L. Coleman	15
The role of the Karman number in suspended sediment transport Gerd Holtorff	23
Settling velocity of mud flocs: Measurements in the field and in the laboratory Walter Puls, Herbert Kuehl & Detlef Kraas	29
Investigations of particle motions in turbulent flow K.Färber	33
Separation of suspensions in a Taylor column Albert Gyr	37
On the motion of solids in viscous sublayers of a pipe flow W.Lanzendorf	43
2 Concentration distribution and transport of suspended load under steady flow conditions	
Mathematical models for sediment concentration profiles in steady flow Leo C.van Rijn	49
On the sediment concentration at the reference level in alluvial channel flow L.Montefusco & A.Valiani	69
Comparison of different theories for the vertical distribution of suspended sediment concentration with measurements <i>M.Vetter</i>	75

The studies in both the USSR and the East European countries on the vertical suspended sediment concentration distribution <i>G.Gergov</i>	81
Mechanics of suspended sediment transport C.T.Yang	87
The validity of a depth-integrated model for suspended sediment transport in open channels Z.B. Wang & J.S. Ribberink	93
Sediment transport under steady, non-equilibrium situations I.Celik & W.Rodi	97
Sediment transport in rigid boundary channels Chandra Nalluri	101
3 Reservoir sedimentation, settling basins	
Design and calculation of reservoirs of run of river stations incorporating sedimentation <i>H.P.Hack</i>	107
The sedimentation of solid particles during the flow of suspension in a long channel Mariusz R.Sławomirski & Alfred Trzaska	113
The influence of input parameter scatter on calculating sedimentation processes Wolfram Schrimpf	123
Simulation of hydrodynamic and transport characteristics of rectangular settling basins I.Celik & W.Rodi	129
Model tests for sedimentation processes in reservoirs W.Mertens	133
Modelling of suspension transportation and sedimentation in backwater flow Peter Müller	137
4 Resuspension, suspended and bed-load interaction	
The interaction of suspended flow with the bed shape in an open erodible channel <i>B.de Jong</i>	145
The case for the applied stream power approach in sediment transport A.Rooseboom	155
Turbulence and suspension related to different bed roughness Ulrich Zanke	157
Physical modelling of suspended load M.S. Yalin, O.J.Sayao & G.K.Y.Lai	161
Criteria for estimating dune height in alluvial sand beds Luigi Montefusco & Enio Paris	171

Analyses of United States Geological Survey sediment transport data for some California streams	177
Peter A.Mantz & William W.Emmett	
Observations of the turbulent fluxes of suspended sand near the sea-bed R.L. Soulsby, A.P.Salkield, R.A.Haine & B.Wainwright	183
Turbulence in terms of coherent structures and their relation to sand concentration in tidal channels <i>H.P.J.Mulder, L.H.M.Kohsiek &amp; A.C.van der Kolk</i>	187
5 Suspended sediment transport under nonsteady flow conditions	
A simple model for suspended material transport in depth-averaged channel flow KP.Holz & A.Crotogino	197
Numerical simulation of unsteady suspended sediment transport Mark Markofsky, Günther Lang & Reiner Schubert	201
6 Special topics	
Solid/solution relations of contaminants in surface waters Ulrich Förstner	209
New technology and automation of continuous sediment concentration measurement Eberhard Renger	221
Suspended sediment measurements in the Elbe Estuary at Hamburg using a CUX-SAMPLER Hermann Christiansen	229
Measurement of optical light attenuation profiles in the Elbe estuary R.Riethmüller, M.Schröder & U.Maixner	233
Flow measurements in a solid-liquid suspension by use of ultrasound and light techniques O.Scrivener, C.Belibel, A.Hazzab & H.Reitzer	239
Effect of transport in suspension on flow in weakly meandering channels G.Seminara & M.Tubino	247
Sediment yield prediction from small watershed with the universal soil loss equation and sediment delivery ratio <i>K.Banasik</i>	255
Flow of shallow fluidized beds in an airslide L.Neužil & M.Turcajová	259
Closure W.Bechteler	265