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Chapter 1 : Course - Numerical Methods for Hyperbolic Problems in Fluid Dynamics - EP - NTNU

*"The AMS-IMS-SIAM Joint Summer Research Conference in the Mathematical Sciences on Current Progress in Hyperbolic Systems: Riemann Problems and Computations was held at Bowdoin College, Brunswick, Maine, on July ,
"--CIP t.p. verso.*

Liu Embedded hyperbolic regions in a nonlinear model for visco-elastic flow by G. Cook Capillary energy and the entropy condition for the Buckley-Leverett equation by I. Aavatsmark Nonlinear elastoplastic waves by S. Szymczak An example of a Riemann problem of second kind by M. Brio Density profiles for diverging detonations by B. Bukiet Anomalous waves in shock wave-fluid interface collisions by J. Grove Time-dependent shear flow of a non-Newtonian fluid by D. Plohr The Riemann problem for combustion by T. Zhang Transitional shock waves by E. Plohr Three-phase flow with gravity by J. Trangenstein A system of conservation laws with a parabolic degeneracy by B. Bohannon Nonlinear surface waves by J. Hunter A criterion for certain wave structures in systems that change type by B. Keyfitz A note on the stability of eigenvalue degeneracy in nonlinear conservation laws of multiphase flow by D. Menikoff Instability and ill-posedness in granular flow by E. Serre The Riemann problem for a system of conservation laws modeling phase transitions by V. Roytburd Detonation waves and deflagration waves in the one dimensional ZND model for high Mach number combustion by D. Wagner The Riemann solution to a system of conservation laws, with application to a non-zero sum game by G. Rustichini Asymptotic stability of planar rarefaction waves for scalar viscous conservation laws in several dimensions by Z. Xin Riemann problem for a combustion model system: Teng Dynamic instability of the liquid crystal director by R. Saxton On the Riemann problem for a prototype of a mixed type conservation law. The general direction of the research has headed toward understanding the wave structure of the solutions of more physically realistic systems. These systems fail either or both of the two main restrictions of the classical theory - that the system be strictly hyperbolic or genuinely nonlinear. The systems that have been studied tend to fall into the following broad classes: In addition to their usefulness in large-scale calculations, computational schemes have vastly improved the handling of discontinuity behavior. The papers presented here provide a complete picture of recent research by some of the leaders in this field. Graduate students and beginning researchers will find this book a useful introduction to current work in this area. Nielsen Book Data Subjects.

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Chapter 2 : Current Progress in Hyperbolic Systems: Riemann Problems and Computations

This volume contains the proceedings of the AMS-IMS-SIAM Joint Summer Research Conference on Current Progress in Hyperbolic Systems: Riemann Problems and Computations, held at Bowdoin College in July

Neuroadaptive changes of dendritic spines in nucleus accumbens after chronic alcohol drinking in alcohol-preferring rats. PDF version - W. Quantifying topological change in bone under uniform erosion. PDF version - M. Porous structure and fluid partitioning in polyethylene cores from 3D X-ray microtomographic imaging. The geometry of primary drainage. PDF version - R. X-ray computed microtomography studies of fluid partitioning in drainage and imbibition before and after gel placement: Accepted by SPE Journal. Accepted by Advances in Water Resources. X-ray computed microtomography studies of disproportionate permeability reduction. Word version - H. Analysis of the vesicular structure of basalts. Automated algorithms for multiscale morphometry of neuronal dendrites. Cerebral Cortex, in press. Studies of the microstructure and properties of dense ceramic coatings produced by high-velocity oxygen-fuel combustion spraying. Fracture flow simulation using a finite difference lattice Boltzmann method. An algorithm for reconstruction of neurite outgrowth images. Study of the microgeometry of porous materials using synchrotron computed microtomography. Geological Society, London, Special Publications, A parallelized, structured-unstructured hybrid, tetrahedral grid construction. Use of X-ray computed microtomography to understand why gels reduce permeability to water more than to oil. Predictability in Stochastic Reservoirs. Network flow model studies and 3D pore structure. Contemporary Mathematics, The 2-dimensional Riemann problem for a 2×2 hyperbolic conservation law I. The 2-dimensional Riemann problem for a 2×2 hyperbolic conservation law II. Characterizing disproportionate permeability reduction using synchrotron X-ray computed microtomography. Accurate estimation of transport properties from microtomographic images. Automated 3D dendritic spine detection and analysis from two-photon microscopy, in Three-Dimensional and Multidimensional Microscopy: A Dowd, and D. Synchrotron X-ray computed microtomography CMT studies on vesiculated basaltic rocks. Bulletin of Volcanology 63 Three-dimensional image analysis of fibrous materials. Direct and stochastic generation of network models from tomographic images: Effect of topology on residual saturations. Transport in Porous Media 46 Pore and throat size distributions measured from synchrotron X-ray tomographic images of Fontainebleau sandstones. Research, B, Development, implementation, and experimental validation of the lattice Boltzmann method for modeling three-dimensional complex flows. Investigating 3D geometry of porous media from high resolution images, Phys. Earth A , 25, Statistical characterization of the three-dimensional microgeometry of porous media and correlation with macroscopic transport properties, Int. Applications of front tracking to the simulation of resin transfer molding. Computers and Mathematics with Applications, 33, Medial axis analysis of void structure in three-dimensional tomographic images of porous media. Confidence estimation in history matched models. Adler, Synchrotron computed microtomography of porous media: A stochastic kriging algorithm. An edge-based algorithm to filter tomographic data sets. Structural reliability analysis for one dimensional, two phase miscible flow. A theory of macrodispersion for the scale up problem. Transport in Porous Media, 13, A theory of fluid mixing. Lecture Notes on Numerical Fluid Dynamics, 43 pp. An analysis of field data permeability. Scaling laws for macrodispersion. Mathematical Modeling in Water Resources, pp. The multi-fractal hypothesis and anomalous diffusion. Revista Brasileira de Matematica Aplicada e Computacional, 11, Determination of polymerization particle morphology using synchrotron computed microtomography. Scale-up in fractal rock. Time dependent anomalous diffusion for flow in multi-fractal porous media. Lecture Notes in Physics, pp. Characterization of mixing length growth for flow in heterogeneous porous media. Multi-length scale computations of the mixing length growth in tracer flow. Proceedings of the Emerging Technologies Conference, F. Eighth-order anomalous magnetic moment of the electron. Diagrams containing no vacuum polarization loop. Vertex diagrams containing photon-photon scattering subdiagrams. D, 39, pp. Front tracking, oil reservoirs,

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engineering scale problems and mass conservation. Riemann Problems and Computations, W. Front tracking and the interaction of nonlinear hyperbolic waves. Lecture Notes in Engineering, 43, pp. The two dimensional interaction of nonlinear hyperbolic waves: On the simulation of heterogeneous petroleum reservoirs. The scalar Riemann problem in two spatial dimensions: Reservoir simulation by the method of front tracking. The bifurcation of tracked scalar waves. Sharp and diffuse fronts in oil reservoirs: Stability of two dimensional immiscible flow to viscous fingering. Construction of solutions for two dimensional Riemann problems. Calculation of the eighth order anomalous magnetic moment of the electron. Front tracking for petroleum reservoir simulation. SPE manuscript number McBryan, and L Padmanabhan. A front tracking reservoir simulator 5-spot validation studies and the coning problem. Statistical fluid dynamics II: The influence of geometry on surface instabilities. Lindquist, Eighth-order anomalous magnetic moment of the electron. Sixth-order vertex containing a second-order vacuum polarization subdiagram. D 27, pp. Fourth-order vertex containing second- and fourth-order vacuum polarization subdiagrams. Second-order vertex containing second- fourth-, and sixth-order vacuum polarization subdiagrams. Parametric formula for the sixth-order vacuum polarization contribution in quantum electrodynamics.

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Chapter 3 : CiteSeerX " Citation Query A criterion for certain wave structures in systems that change type

The study of Riemann problems has undergone a strong, steady growth in the last decade. The general direction of the research has headed toward understanding the wave structure of the solutions of more physically realistic systems. These systems fail either or both of the two main restrictions of.

Show Context Citation Context The three-phase flow region shaded area is, in this case, an equilateral triangle inside the ternary diagram. To simplify notation, we shall drop the tildes from Eq. Loss of Strict Hyperbolicity in Conventional M We review recent progress in the theory of mixed-type systems of conservation laws with small diffusive terms, with emphasis on results pertinent to three-phase flow. In particular, we show that this theory can be applied to increase the rate of oil recovery, during certain production periods, in a In particular, we show that this theory can be applied to increase the rate of oil recovery, during certain production periods, in a recovery method commonly employed in petroleum engineering that is based on alternate injection of water and gas WAG. Introduction In secondary oil recovery, water or gas is injected into a well to displace oil in situ to the producing well. It is well established that oil recovery is enhanced by alternately injecting gas and water Water-Alternating-Gas, or WAG rather than injecting pure water or gas. The purpose of this work is to understand the wave structure of three-phase WAG flow in a rock core sample. We show that, in addition to classical shock and rarefaction waves, there occur The wave structure and asymptotic behavior for models with elliptic regions is more complicated than that for models with umbilic points [11, 1, 2, 3, 4, 5, 15, 16, 12, 36, 17, 18, 33]. In fact, a r For linear immiscible three-phase flow, potentially threequarters of the oil recovered through a WAG process can be caused by a non-Buckley-Leverett "transitional" shock wave. This nonclassical kind of wave is common in three-phase flow. In this paper, we show how transitional waves arise In this paper, we show how transitional waves arise in WAG flow and how they can be calculated by semi-analytic methods, which are helpful in the design of effective WAG recovery strategies. Introduction In secondary oil recovery, water or gas is injected into a well to displace in situ oil to the producing well. It is well established that oil recovery can be improved by alternately injecting gas and water Water-Alternating-Gas, or WAG, injection rather than injecting pure water or gas. The purpose of this work is to understand the wave structure of three-phase WAG flow in a core sample. We show that, in addition to classical Buckley-Leverett shock waves and auxiliary slow waves, there occur two significant features:

Chapter 4 : Publication list W.B. Lindquist

Current progress in hyperbolic systems, Riemann problems and computations: proceedings of the AMS-IMS-SIAM joint summer research conference held July , with support from the National Science Foundation and the Office of Naval Research.

Chapter 5 : [] A Hybrid Riemann Solver for Large Hyperbolic Systems of Conservation Laws

The study of Riemann problems has undergone a strong, steady growth in the last decade. The general direction of the research has headed toward understanding the wave structure of the solutions of more physically realistic systems.

Chapter 6 : AMS eBooks: Contemporary Mathematics

Current Progress in Hyperbolic Systems: Riemann Problems and Computations About this Title. W. Brent Lindquist, Editor. Publication: Contemporary Mathematics.