

Referências Bibliográficas

ALVARENGA, J. E. M. **Modelagem Numérica do Transporte de Vírus em Aqüiferos Fraturados-Porosos.** Dissertação de Mestrado. Departamento de Engenharia Civil, Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro, 2008, 257pp.

ANSYS ICEM CFD 12.0 – Tutorial Manual. Version 12.0, April 2009

ARORA, J. S. **Introduction to Optimum Design,** McGraw-Hill, 1989, New York.

ATTEWELL, P. B.; WOODMAN, J. P. Stability of Discontinuous Rock Masses Under Polyaxial Stress Systems In 13th Symposium on Rock Mechanics, **Stability of Rock Slopes.** ASCE, New York, 1969, p. 665 -683.

BAE, D.-s.; KIM, K.-s; KOH, Y.-k.; KIM, J.-y. Characterization of Joint Roughness in Granite by Applying The Scan Circle Technique to Images From a Borehole Teviewer. **Rock Mechanics and Rock Engineering**, v.44, n. 4, 2011, p. 497 – 504.

BARENBLATT G.I.; ZHELTOV, IU.P.; KOCHINA, I.N. Basic Concepts in The of Seepage of Homogeneus Liquids in Fissured Rocks, **PMM**, volume 24, number 5, 1960, p. 852 -864.

BARTON, C.A.; ZOBACK, M.D.; MOOS, D. Fluid Flow Along Potentially Active Faults in Crystalline Rock. **Geology** 23 (8),1995, p. 683–686.

BEAR, J. **Dynamics of Fluids in Porous Media.** American Elsevier, New York, 1972.

BEAR, J.; TSANG, CH.; DE MARSILY, G. **Flow and Contaminant Transport in Fractured Rock.** Academic Press, Inc, California, 1993.

BERKOWITZ, B.; BEAR, J.; BRAESTER, C. Continuum Models for Contaminant Transport in Fractured Porous Formations. **Water Resour. Res.**, 24(8), 1988, p. 1225-1236.

BERKOWITZ, B. Characterizing Flow and Transport in Fractured Geological Media. A Review. **Advances in Water Resource** 25 (8–12), 2002, p. 861–884.

BLÖCHER, M. G.; CACACE, M.; LEWERENZ, B.; ZIMMERMANN, G. Three Dimensional Modelling of Fractured and Faulted Reservoirs: Framework and Implementation, **Chemie der Erde**, Nº 70, 2010, p.145 - 153.

BONNET, E.; BOUR, O.; ODLING, N. E.; DAVY, P.; MAIN, I.; COWIE, P., BERKOWITZ B. Scaling of Fracture Systems in Geological Media, **Reviews of Geophysics**, v. 39, n. 3, p. PP. 347-383, 2011.

BOURGEAT, A.; CHECHKIN, G.A.; PIATNITSKI, A.L. Singular Double Porosity Model, **Applicable Analysis**, volume 82, number 2, 2003, p. 103 -116.

CELIA, M. A.; Ahuja, L. R. e Pinder, G. F. (1987). Orthogonal collocation and Alterating- Direction Procedures for Unsaturated Flow Problems, **Adv. Water Resour.**, 10, 178-187 pp.

COLI, N.; PRANZINI, G.; ALFI, A.; BOERIO, V. Evaluation of Rock-Mass Permeability Tensor and Prediction of Tunnel Inflows by Means of Geostructural Surveys and Finite Element Seepage Analysis. **Engineering Geology**, 101, 2008, p. 174 - 184.

COOK, P. G. **A Guide to Regional Groundwater Flow in Fractured Rock Aquifers**.CSIRO, Australia, 2003.

COOLEY, R. L. Some New Procedures for Numerical Solution of Variable Saturated Flow Problems.**WaterResour. Res.**, 19(5), 1983, p. 1271 - 1285.

COTES, A.; VIVES, L.; SÁNCHEZ-VILA, X.; CARRERA, J.; ELORZA, F. J.; VELA GUZMÁN, A.; BAJOS PARADA, C. ¿Existe un Tensor de Conductividade Equivalente en una Red de Fracturas Discretas?.**Grupo de Hidrologia Subterranea**, Universidad Politécnica de Cataluña, España, 201?.

DA SILVA, J. C. **Modelagem e Simulação Numérica do Fluxo Bifásico e do Transporte Multicomponente em Meios Porosos com interação Termo-Químico**. Dissertação de Doutorado. Departamento de Engenharia Civil, Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro, 2004, 123pp.

DAVY P.; GOC, R.; DARCEL, C.; BOUR, O.; DREUZY, J. R. d.; MURNIER, R. A Likely Universal Model of Fracture Scaling and Its Consequence for Crustal Hydromechanics. **Journal of Geophysical Research**, v.115, p. 13 PP., out 2010.

DIODATO, D. M. A Compendium of Fracture Flow Models. U.S. Department of Defense and U.S. Army, AN/ESD/TM-96,1994.

DORWEILER, R. P. **Aplicação de Modelagem de Turbulência na Camada Limite Atmosférica para Verificar Efeitos Locais de Topografia**. Dissertação de Mestrado em Métodos Numéricos, Área Mecânica Computacional, Setor de Tecnologia e Ciências Exatas, Universidade Federal do Paraná, Curitiba, 2007, 117p.

DREUZY, J. R.; PICHOT, G.; POIRRIEZ, B.; ERHEL, J. Synthetic Benchmark for Modeling Flow in 3D Fractured Media. **Computer&Geosciences**, N° 50, 2013, p. 59 - 71.

ETS Ingenieros de Caminos, Canales y Puertos. Universidad de Coruña.
Curso de Hidrología Subterránea, Coruña, España, 2011 -2012.

FERREIRA, ADRIANO ALMEIDA. Simulação de Fluxo no Meio Poroso Utilizando o Fluent. Dissertação de Mestrado. Departamento de Engenharia Petroleo (PPGCEP), Universidade Federal do Rio Grande do Norte, Natal, 2009.

FOOKES, P. G.; PARRISH, D. G. Observations on Small-Scale Structural Discontinuities in The London Clay and Their Relationship to Regional Geology. **Quartely Journal of Engineering Geology.** 1, 1969, p. 217 -240.

GARCIA, F.; PALACIO, C.; GARCIA, U. Generación de Mallas no Estructuradas para la Implementación de Modelos Numéricos. **Dyna**, año 76, Nro. 157, p 17-25. Medellin, 2009.

GASPAR, L. A. G.; DOS SANTOS, J. S.; PITOMBEIRA, E. DS. Influência da Geometria das Fraturas na Conectividade de dos Aquíferos Fissurais. **I Congresso Internacional de Meio Ambiente Subterrâneo**, São Paulo, 2009.

GERKE, H. H.; VAN GENUCHTEN, M. T. Evaluation of a First-Order Water Transfer Term for Variably Saturated Dual-Porosity Flow Models. **Water Resources Research**, volume 29, number 4, 1993, p. 1225 - 1238.

GIMÉNEZ, D.; PERFECT, E.; RAWLS, W.J.; PACHEPSKY, YA. Fractal Modelos for Predicting Soil Hydraulic Properties: a Review. **Engineering Geology.**48, 1997, p.161 -183.

GOODMAN, R. E. **Methods of Geological Engineering in Discontinuous Rocks**, West, St Paul,1976.

GUDMUNDSSON, A. Fluid Overpressure and Flow in Fault Zones: Field Measurements and Models. **Tectonophysics** 336 (1–4), 2001, p.183–197.

HE JI; CHEN SHENG-HONG.A Revised Solution of Equivalent Permeability Tensor for Discontinuous Fractures. **Journal of Hydrodynamics.**24(5), 2012, p.711 -717.

HUNT, A. G. **Percolation Theory for Flow in Porous Media**. EUA: Springer-Verlag, 2005.

HUYAKORN, P. S.; THOMAS, S. D.; THOMPSON, B. M. Techniques for Making Finite Elements Competitive in Modeling Flow in Variably Saturated Porous Media.**WaterResour. Res.**, 20(8), 1984, p.1099 - 1115.

IGME - INSTITUTO GEOLÓGICO Y MINERO DE ESPAÑA. **Isótopos Ambientales en el Ciclo Hidrológico Principios y Aplicaciones – Programa Hidrológico Internacional.** Series: Guias y Manuales Nº1. Editor W.G Mook. Madrid, 2002.

ILLMAN, W. A.; HUGHSON, D. L.; Stochastic Simulations of Steady State Unsaturated Flow in a Three-layer, Heterogeneous, Dual Continuum Model of Fractured Rock. **Journal of Hydrology**, 307, 2005, p.17 - 37.

ISIDRO, S. G. **Transición de Percolación en Flujos en Rocas y Exponentes Anómalos**. Dissertação de Doutorado. Programa de Pós-Graduação em Aproveitamento de Recursos Hidráulicos, Universidad Nacional de Colombia, Facultad de Minas, Medellin, 2000

JEONG, T. J.; LEE, K. J. A Single Continuum Approximation of The Solute Transport in Fractured Porous Media. **Ann. Nucl. Energy**, volume 19, No 8, 1992, p. 459 - 470.

JUANES, R.; SAMPER, J. Uma Formulación General y Eficiente de Las Fracturas en el MEF: I. Aspectos Teóricos. **Revista Internacional de Métodos Numéricos para Cálculo y Diseño em Ingenieria**, volume 16, 4, 2000, p.471 - 491.

KIRALY, L. FEM301-A Three-dimensional Model for Groundwater Simulation: Documentation and user's guide. Rep. **NAGRA NTB.**, 84-89, pp. 96, 1985.

KIRALY, L. Large Scale 3D Groundwater Flow Modelling in Highly Heterogeneous Geologic Medium, **Groundwater Flow and Quality Modelling**, E Custodio et al. (Eds), Dordrecht, Holland, D. Reidel Publishing Co. 1987, p. 761 – 775.

KONIKOW, L. F.; MERCER, J. W. Groundwater Flow and Transport Modeling. **Journal of Hydrology**. 100, 1988, p. 379 -409.

LEMOS, J. M. F. **No Domínio da Hidráulica das Rochas**. Dissertação de Doutoramento em mecânica dos Fluidos. Faculdade de Engenharia da Universidade do Porto, 1976.

LEWANDOWSKA, J.; SZYMKIEWICZ, A; BURZYNSKI, K.; VAUCLIN, M. Modeling of Unsaturated Water Flow in Double Porosity Soils by the Homogenization Approach. **Advances in Water Resources**, 27, 2004, p.283 - 296.

LI, P; LU, W.; LONG, Y.; YANG, Z.; LI, J. Seepage Analysis in a Fractured Rock Mass: The Upper Reservoir of Pushihe Pumped-Storage Power Station in China. **Engineering Geology**, 97, 2008, p.53 - 62.

LIU, H-H.; BODVARSSON G. S. Constitutive Relations for Unsaturated Flow in A Fracture Network. **Journal of Hydrology**, 252, 2001, p. 116 - 125.

LIU, H-H.; HAUKWA, C. B.; AHLERS, C. F.; BODVARSSON, G. S.; FLINT, A. L.; GUERTAL, W. B. Modeling Flow and Transport in Unsaturated Fractured Rock: An Evaluation of The Continuum Approach. **Journal of Contaminant Hydrology**, 62 - 63, 2003, p.173 - 188.

LONG, J. C. S.; REMER, J. S.; WILSON, C. R.; WITHERSPOON, P. A. Porous Media Equivalents for Networks of Discontinuous Fractures, **Water Resources Research**, Vol. 18, No 3, 1982, p. 654 - 658.

LOUIS, C. **A Study of Groundwater Flow in Jointed Rock and Its Influence on The Stability of Rock Masses**. Imperial College Research Report n.10. Royal School of Mines, 1969.

LOUIS, C. **Fluxo de Água a 3 Dimensões em Rochas Fissuradas**. Tradução Jayme de Oliveira Campos. Associação Brasileira de Geologia de Engenharia. Centro de Mecânica das Rochas, Imperial College, Londres 5W 7, 1974.

MAGALHÃES, G. M.; PASSARO, P.; ABE, N. Geração de Malha de Delaunay Orientada a Objetos. **Anais de Worcomp'2000**, Workshop de Computação, São José dos Campos, São Paulo, 17-18/10/2000, p.73 - 79.

MAGRI, F.; AKAR, T.; GEMICI, U.; PEKDEGER, A. Deep Geothermal Groundwater Flow in The Seferihisar-Balçova Area, Turkey: Results From Transient Numerical Simulations of Coupled Fluid Flow And Heat Transport Processes. **Geofluids**, published online January 20, 2010.

MARIN, I. S. P. **Aperfeiçoamento do Método de Elementos Analíticos para Simulação de Escoamento em Rochas Porosas Fraturadas**. Tese de Doutorado, Escola de Engenharia de São Carlos da Universidade de São Paulo, departamento de Engenharia Hidráulica e Saneamiento, São Paulo, 2011, 132pp.

MENDOZA, C. A., THERRIEN, R. E SUDICKY, E. A. ORTHOFEM User's Guide, Version 1.02, Waterloo Centre for Groundwater Research, Univ. of Waterloo, Waterloo, Ontario, Canada.1991.

MERCER, J. W.; & FAUST, C. R.; **Ground-water Modeling**. Natl. Water Well Assoc. Worthington. Ohio, 1981, 60pp.

MOECK, I.; SCHANDELMEIER, H.; HOLL, H.G. The Stress Regime in A Rotliegend Reservoir of The Northeast German Basin. **International Journal of Earth Sciences**, 98 (7), 2008, p. 1643–1657.

MONACHESI, LEONARDO B.; GUARRACINO, LUIS. Un Modelo Fractal Para Estimar La Conductividad Hidráulica no Saturada de Rocas Fracturadas. **GEOACTA Asociación Argentina de Geofísicos y Geodestas**, 35, 2010, p.66 - 67.

MORALES, H. E. G. **Estudio de Geometria Fractal en Roca Fracturada y Series de Tiempo**. Memoria para Optar al Título de Ingeniero Civil, Facultad de Ciencias Físicas y Matemáticas, Departamento de Ingeniería Civil, Universidad de Chile, Santiago de Chile, 2008.

MUALEM, Y. A New Model to Predict The Hydraulic Conductivity of Unsaturated Porous Media. **Water Resour. Res.**, 12: 513 – 522..

NAIR, V. V.; THAMPI, S. G. Numerical Modeling of Contaminant Transport in Sets of Parallel fractures With Fracture Skin Fractured, **Journal of Porous Media**, 15 (1), 2012, p.95 - 100.

NEUTRAL FILE. Manual Neutral File. (revisado 2002), <https://web.tecgraf.puc-rio.br/neutralfile/>.

NEUMAN, S. P. Galerkin Approach to Saturated-Unsaturated Flow in Porous Media, **Chapter 10 in Finite Elements in Fluids**, Vol. I, Viscous Flow and Hydrodynamics, Edited by R. H. Gallagher, J. T. Oden, C. Taylor, and O.C. Zienkiewicz., p. 201-217, Jhon Wiley and Sons, London, 1975.

NEUMAN, S. P. Trends, Prospects and Challenges in Quantifying Flow and Transport Through Fractured Rocks. **Hydrogeology Journal** 13 (1), 2005, p. 124 - 147.

PAN, JIAN-BANG; LEE, CHEN-CHANG; YEH, HSIN-FU; LIN HUNG-I. Application of Fracture Network Model With crack Permeability Tensor on Flow and Transport in Fractured Rock. **Engineering Geology**, 116, 2010, p. 166 - 177.

PANICONI, C.; ALDAMA, A. A.; WOOD, E. F. Numerical Evaluation of Iterative And Non Iterative Methods for The Solution of Nonlinear Richards Equation. **Water Resour. Res.** 27, 1991, p. 1147–1163.

PERROCHET, P. Finite Hyperelements: A 4D Geometrical Framework Using Covariant Bases and Metric Tensors, **Communications in Numer.**, Meth. Engng., Vol. 11, N 6, 1995, p. 525-534.

PINDER, G. F.; & GRAY, W. G. **Finite Element Simulation in Surface and Subsurface Hydrology**. Academic Press, New York, 1977.

PIMENTAL, M. L. P. **Simulação de Fluxo Água e Transporte de Solutos na Zona Não-Saturada do Solo pelo Método de Elementos Finitos Adaptativo**. Tese de Doutorado. Área de Concentração: Engenharia Hidráulica e Saneamento, Programa de Pós-Graduação em Ciências da Engenharia Ambiental, Escola de Engenharia de São Carlos, Universidade de São Paulo, São Carlos, 2009.

PINDER, G. F.; & GRAY, W. G. **Finite Element Simulation in Surface and Subsurface Hydrology**. Academic Press, New York, 1977.

PRIEST, S. D. **Geotechnical Aspects of Tunnelling in Discontinuous Rock with Particular Reference to The Lower Chalk**, Ph.d. Thesis. University of Durham, Durham, UK. 1975.

REMSON, I.; HORNBERGER, G. M. & MOLZ, F. J. **Numerical Methods in Subsurface Hydrology**, Wiley, New York, N.Y., 1971, 389 pp.

RUPPERT, J. A Delaunay Refinement Algorithm for Quality 2-Dimensional Mesh Generation. **Journal of Algorithms**.18, 1995, p. 548 -585.

SAHIMI. Flow and Transport in Porous Media and Fractured Rock: From Classical Methods to Modern Approaches. Weinheim, New York, Basel, Tokyo: VCH, 1995.

SAMARDZIOSKA, T.; POPOV, V. Numerical Comparison of the Equivalent Continuum, Non-Homogeneous and Dual Porosity Models for Flow and Transport in Fractured Porous Media. **Advances in Water Resources**, 28, 2005, p.235 - 255.

SANGARE, D.; THOVERT, J. -F.; ADLER, P. M. Macroscopic Properties of Fractured Porous Media. **Physica A.**, 389, 2010, p. 921-935.

ŠEJNA, M.; ŠIMŮNEK J.; VAN GENUCHTEN, TH. M. **The HYDRUS Software Package for Simulating the Two-and Three-Dimensional Movement of Water, Heat, and Multiple Solutes.** PC-Progress, Hydrus User Manual, version 2, 2012.

SCHECK-WENDEROTH, M.; KRZYWIEC, P.; MAYSTRENKO, Y.; ZÜHLKE, R., FROITZHEIM, N. Permian to Cretaceous tectonics of Central Europe. In: McCann, T.(Ed.), Geology of Central Europe, vol.2. **Geological Society Special Publication**, London, 2008, p.999–1030.

SHEWCHUK, J. R. **Delaunay Refinement Mesh Generation.** Thesis Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, School of Computer Science, Computer Science Department, Carnegie Mellon University, Pittsburgh, USA, 1997.

SILVA, J. C. **Modelagem e Simulação Numérica do Fluxo Bifásico e do Transporte Multicomponente em Meios Porosos com Interação Termo-Química.** Dissertação de Doutorado. Departamento de Engenharia Civil, Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro, 2004, 123pp.

ŠIMŮNEK, J.; HUANG, K.; VAN GENUCHTEN, M. T. **The SWMS_3D Code for Simulation Water Flow and Solute Transport in Three-Dimensional Variably-Saturated Media.** U.S. Salinity Laboratory Agricultural Research Service, n°139, version 1.0, 1995.

ŠIMŮNEK J.; JARVIS, N.J.; VAN GENUCHTEN, TH.M.; GÄRDENÄS A. Review and Comparison of Models for Describing Non-Equilibrium and Preferential Flow and Transport in the Vadose Zone. **Journal of Hydrology**.272, 2003, p. 14 -35.

SNOW, D.T. The Frequency and Apertures of Fractured in Rock. **Int. J. Rock Mech. Min. Sci.** Volume 7, 1970, p. 23 -40.

SUDICKY, E. A.; MC LAREN, R. G. The Laplace Transform Galerkin Technique for Large-Scale Simulation of Mass Transport in Discretely-Fractured Porous Formations. **Water Resour. Res.**, 28(2), 1992, p. 499-514.

TANIGUCHI, T.; FILLION, E. Numerical Experiments for 3-Dimensional Flow Analysis in a Fractured Rock with Porous Matrix. **Advances in Water Resources**, volume 19, number 2, 1996, p. 97 - 107.

TELLES, I. A. **Desenvolvimento de um Sistema Integrado para Modelagem de Fluxo e Transporte em Meios Porosos e Fraturados**. Dissertação de Doutorado. Departamento de Engenharia Civil, Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro, 2006, 164pp.

THERRIEN, R.; SUDICKY, E.A. Three-dimensional Analysis of Variably-Saturated Flow and Solute Transport in Discretely-fractured Porous Media. **Journal of Contaminant Hydrology**.23, 1996, p. 1 -44.

THIEL, K. **Rock Mechanics in Hydroengineering**. Developments in Geotechnical Engineering, PWN-Polish Scientific Publisher, Warzovia, 1989.

VAN GENUCHTEN, TH. M. **A Closed-form Equation for Predicting the Hydraulic Conductivity of Unsaturated Soils**, Soil Science Society of America Journal, volume 44, no 5, 1980.

VARGAS, E. A. Jr.; BARRETO, A. B. C. Considerações Sobre Aspectos do Fluxo em Aquíferos Fraturados Relevantes à Exploração de Água. **I Simpósio de Hidrogeologia do Sudeste**, XII Encontro Nacional de Perfuradores de Poços. 2003, p.71-82.

WANG, J. F.; & ANDERSON, M. P. **Introduction to Groundwater Modeling**. Freeman, San Francisco, Calif., 1982, 237 pp.

WEI, Z.Q.; EGGER, P.; DESCOEUDRES, F. Permeability Predictions for Jointed Rock Masses. **Int. J. Rock Mech. Min. Sci. & Geomech.** Abstr. Volume 32, No. 32,1995, p.251 -261.

ZIENKIEWICZ, O. C. **The Finite Element Method**.3rd ed., McGraw-Hill, London, United Kingdom, 1977.

ZHANG, LIMIN; FREDLUND, D. G. Characteristics of Water Retention Curves for Unsaturated Fractured Rocks, Second Asian Conference on Unsaturated Soils, **UNSAT - ASIA**, april 15 -17, Osaku, Japan.

ZHANG, XING; SANDERSON, DAVID J. Anisotropic Features of Geometry and Permeability in Fractured Rock Masses, Department of Geology, University of Southampton, Southampton, SO17 1BJ, United Kingdom, **Engineering Geology**, 40,1995, p.65-75.

ZHOU, Q.; LIU, H-H.; BODVARSSON, G. S.; OLDENBURG, C. M. Flow and Transport in Unsaturated Fractured Rock: Effects of Multiscale Heterogeneity of Hydrogeologic. **Journal of Contaminant Hydrology**, 60, 2003, p.1 - 30.