

Referências Bibliográficas

ABAQUS. **ABAQUS User's Manual**. ABAQUS© vs. 6.10. Providence, Rhode Island, USA. 2010.

AHR, W. M. **Geology of Carbonate reservoirs: The Identification, Description, and Characterization of hydrocarbon Reservoirs in Carbonate Rocks**. New Yersey: John Wiley & sons, Inc., 2008. ISBN 1-277.

—————; ALLEN, D.; BOYD, A.; BACHMAN, H. N.; SMITHSON, T.; CLERKE, E. A.; RAMAMOORTHY, R. Confronting the carbonate conundrum. **Oilfield Review**, v. 17, n. 1, p. 18-29, 2005. ISSN 0923-1730.

AKBAR, M.; ALGHAMDI, A.; VISSAPRAGADA, B.; ALLEN, D.; HERRON, M.; CARNEGIE, A.; DUTTA, D.; OLENSON, J. R.; CHOURASUYA, R.D.; LOGAN, D.; STIEF, D.; NETHERWOOD, R.; RUSSELL, S. D.; SAXENA, K. Evaluación de yacimientos carbonatados. **Oilfield Review**, 7, n. 1, Primavera 1995. 38-57.

ALONSO, A. M.; MARTÍN, P. A.; MARTÍN, G. R. Petrología Sedimentaria. Notas de Teoría. 9. Rocas carbónicas: Diagénesis. **REDUCA (Geología)**, Madrid, v. 2, n. 3, 19 jan. 2010. Acesso em: 16 out. 2012.

ALVES DRUMMOND, JOSÉ LUIS; COELHO CARVALHO, LÚCIA; BAUD, PATRICK; GUEVARA JR , NESTOR OSCAR; WONG, TENG FONG. **Estabilidade de Poços em Rochas Carbonáticas**. 4^o Congresso Brasileiro de Pesquisa e Desenvolvimento em Petróleo e Gás. Campinas, São Paulo. Brasil: [s.n.]. 2007. p. 1-10.

ANGE, T. Um grão de areia: Um pouco sobre geologia sedimentar-Diagêneses. **http://umgraodeareia.com/diagenese/**. Acesso em: 19 out. 2012.

ARNS, C. H.; KNACKSTEDT, M. A.; PINCZEWSKI, W. V.; GARBOCZI, E. J. Computation of linear elastic properties from microtomographic images: Methodology and agreement between theory and experiment. **Geophysics**, Gaithersburg, 67, n. 5, 9-10 2002. 1396-1405.

—————; BAUGET, F.; LIMAYE, A.; SAKELLARIOU, A.; SENDEN, T.; SHEPPARD, A.; KNACKSTEDT, M. Pore-Scale Characterization of Carbonates using X-ray Microtomography. **SPE Journal - Richardson**, Houston, Texas, 10, n. 4, dez. 2005. 475-484.

AUZERAIS, F. M.; DUNSMUIR, J.; FERREOL, B. B.; MARTYS, N.; OLSON, J.; RAMAKRISHNAN, T. S.; SCHWARTZ, L. M. Transport in sandstone: A study based on three dimensional microtomography. **Geophysical Research Letters**, v. 23, n. 7, p. 705-708, 1996. ISSN 0094-8276.

BACOCOLI, G. **Crônica de um Pesquisador Visitante; Consolidação da indústria do petróleo no Brasil**. 1. ed. [S.l.]: [s.n.], 2008. 208 p.

BASHAH, I. N. S.; PIERSON, B. **Quantification of Pore Structure in a Miocene Carbonate Build-up of Central Luconia, Sarawak and Its Relationship to Sonic Velocity**. International Petroleum Technology Conference. Bangkok, Tailândia: 2011. International Petroleum Technology Conference. November 2011. p. 1-10.

BENAVENTE, DAVID; MEDINA-LA PEÑA, FRANCISCO; MARTÍNEZ-MARTÍNEZ, JAVIER; CUETO, NORA; GARCÍA DEL CURA, MARIA ANGELES. Influencia de la petrografía en las propiedades petrofísicas y de durabilidad del Travertino Clásico: valoración de su anisotropía. **Geogaceta**, España, v. 46, p. 147-150, abr. 2009. ISSN 0213-683X.

BERRYMAN, J. G. Single-scattering approximations for coefficients in Biot's equations of poroelasticity. **The Journal of the Acoustical Society of America**, v. 91, n. 2, p. 551, 1992. ISSN 0001-4966.

BIOT, M. A. Mechanics of deformation and acoustic propagation in porous media. **Journal of Applied Physics**, v. 33, n. 4, p. 1482-1498, 1962. ISSN 0021-8979.

BLACKER, T. Automated Conformal Hexahedral Meshing Constraints, Challenges and Opportunities. **Engineering with Computers**, London, 17, n. 3, 2001. 201-210.

BRANDON, D.; KAPLAN, W. D. **Microstructural Characterization of Materials**. West Sussex: Chichester: John Wiley & Sons, Ltd., v. 1, 1999. 424 p. ISBN 0-471-98502-3.

CAPUTO, V. Sedimentos e rochas sedimentares: Intemperismo e rochas sedimentares. **http://www.ufpa.br**, 2012. Disponível em: <http://www.ufpa.br/larhima/Material_Didatico/Graduacao/Geologia_Geral/Sedimentos%20e%20Rochas%20sedimentares.doc>. Acesso em: 16 out. 2012. Notas.

CHEN, CHIEN CHIH; LIN, CHUNG CHERNG; SINOGEIKIN, STANISLAV V.; BASS, JAY D. Elasticity of single-crystal calcite and rhodochrosite by Brillouin spectroscopy. **American Mineralogist**, 86, n. 11-12, 2001. 1525-1529.

CHOQUETTE, P.W.; PRAY, L. C. Geologic nomenclature and classification of porosity in sedimentary carbonates. **American Association of Petroleum Geologists Bulletin**, v. 54, p. 207-250, 1970.

CHRISTANTE, L. Pré-Sal: Desafios científicos e ambientais, São Paulo, n. 3, p. 28-30, 2009.

DE BRESSER, J. H.; EVANS, B.; RENNER, J. On estimating the strength of calcite rocks under natural conditions. **Geological Society**, London, 200, 18 jan. 2002. 309-329. Downloaded from <http://sp.lyellcollection.org>.

DEERE, D. U.; MILLER, R. P. **Engineering Classification and Index Properties for Intact Rock (AFWL-TR-65-116)**. New Mexico, 1996.

DEGHAN, S.; SATTARI, GH.; CHEHREH CHELGANI, S; ALIABADI, M. A. Prediction of uniaxial compressive strength and modulus of elasticity for Travertine samples using regression and artificial neural networks. **Mining Science and Technology**, China, 20, n. 1, 2010. 41-46.

DEMIRDAĞ, S. The effect of using different polymer and cement based materials in pore filling applications on technical parameters of travertine stone. **Construction and Building Materials**, 23, n. 1, 2009. 522–530.

DONISETE DE CAMPOS, MARCO. **simulação numérica de escoamentos de fluidos pelo método de elementos finitos baseado em volumes de controle com a técnica de passo fracionado**. Faculdade de Engenharia da Ilha Solteira, Departamento de engenharia mecânica da Universidade Estadual Paulista "Julio de mesquita Filho" (UNESP). Ilha Solteira, p. 92. 2005.

DUARTE, E. N. **Estudo Paramétrico Para Modelagem E Simulação Computacional De Reservatórios Carbonáticos Em Sub-Sal**. Universidade Federal do Rio de Janeiro, UFRJ. Rio de Janeiro, p. 1-194. 2010.

DUARTE, I. C.; GOMES, E. A. **Introdução à Mecânica das Rochas**. Viçosa: Universidade Federal de Viçosa UFV, 2002. 363 p. ISBN 85-7269-115-4. Cadernos didáticos.

DUNHAM, R. J. Classification of carbonate rocks according to depositional texture. In: Classification of Carbonate Rocks. **AAPG Memori No.1**, Tulsa, OK, p. 108-121, 1962.

DUNSMUIR, J. H.; FERGUSON, S. R.; D'AMICO, K. L. **Design and operation of an imaging X-ray detector for microtomography**. Photoelectric Image Decives, the McGee Symposium. B.L. Morgan. Bristol: Institute of Physics. 1991. p. 257-264.

DÜRRAST, H.; SIEGSMUND, S. Correlation between rock fabrics and physical properties of carbonate reservoir rocks. **International Journal of Earth Sciences**, 88, n. 3, 01 October 1999. 392-408.

DVORKIN, J. Accuracy and relevance of digital rock results: successes and failures. **Ingrain Digital Rock Physics Lab**, 2009. 1-22.

FLANNERY, B. P.; DECKMAN, H. W.; ROBERGE, W. G.; D'AMICO, K. L. Three-dimensional X-ray microtomography. **Science**, New York, v. 237, n. 4821, p. 1439-1444, 1987. ISSN 0036-8075.

FOLK, R. L. Practical petrographic classification of limestones. **AAPG bulletin**, v. 43, n. 1, p. 1-38, 1959. ISSN 0149-1423.

———. Spectral subdivision of limestone types. In Classification of carbonate Rocks. **APPG Memoir**, Tulsa, OK, n. 1, p. 62-84, 1962.

———. Some aspects of recrystallization in ancient limestones. In: Dolomitization and Limestone Diagenesis. **APPG**, 13, 1965. 14-48.

FORD, T. D.; PEDLEY, H. M. A review of tufa and travertine deposits of the world. **Earth-Science reviews**, 41, n. p. 117-175, 1996.

GARBOCZI, E. J.; DAY, A. R. An algorithm for computing the effective linear elastic properties of heterogeneous materials: Three-dimensional results for composites with equal phase poisson ratios. **Mechanics and Physics of Solids**, Great Britain, 43, n. 9, September 1995. 1349–1362.

GARCÍA DEL CURA, M. A.; BENAVENTE, D.; MARTÍNEZ, J. M.; N., CUETO. Sedimentary structures and physical properties of travertine and carbonate tufa building stone, v. 28, n. 1, p. 456-467, mar. 2012. ISSN 0950-0618.

GASSMANN, F. Über die Elastizität poröser Medien. Vierteljahrsschrift Der Naturforschenden Gesellschaft in Zurich, v. 96, p. 1-23, 1951.

GATTAS, M.; MARTHA, L. F. **Notas de aula do curso: CIV 2118-Método dos Elementos Finitos**. Pontifícia Universidade Católica do Rio de Janeiro. Rio de Janeiro. 1992.

GEOMUSEU. Rochas carbonatadas.pdf-geomuseu. **http://geomuseu.ist.utl.pt/GSP2012/Rochas%20carbonatadas/Rochas%20carbonatadas.pdf**. Disponível em: <<http://geomuseu.ist.utl.pt/>>. Acesso em: 16 out. 2012.

GOKCEOGLU, C. A fuzzy triangular chart to predict the uniaxial compressive strength of the Ankara agglomerates from their petrographic composition. **Engineering Geology**, 66, n. 1, 2002. 39-51.

GOLIAS, N. A.; DUTTON, R. W. Delaunay triangulation and 3D adaptive mesh generation. **Finite Elements in Analysis and Design**, 25, n. 3, 1997. 331-341.

GOMES, O. F. M. **Processamento e Análise de Imagens Aplicados à Caracterização Automática de Materiais**. Pontifícia Universidade Católica do Rio de Janeiro. Rio de Janeiro, p. 1-141. 2001. (669G633p).

HU, ZHIGANG; NOTARBERARDINO, BRUNO ; BAKER, MATTHEW; TABOR, GAVIN ; HAO, LIANG; TURNER, IRENE; YANG, LINCOLN. On Modeling Bio-Scaffolds: Structural and Fluid Transport Characterization Based on 3-D Imaging Data. **Tsinghua Science and Technology**, v. 14, n. 1, p. 20–23, June 2009. ISSN 1007-0214.

ISRM. The complete ISRM suggested methods for rock characterization, testing and monitoring: 1974-2006. **International Society for Rock Mechanics (ISRM)**, Ankara, Turkey, April 2007. ISSN 978-975-93675-4-1.

JACKSON, M. D.; MARRA, F.; HAY, R. L.; CAWOOD, C.; WINKLER, E. M. The judicious selection and preservation of tuff and travertine building stone in ancient Rome. **Archaeometry**, Oxford, v. 47, n. 3, p. 485-510, 08 set. 2005. ISSN 0003-813x.

JOUINI, M. S.; VEGA, S. Simulation of elastic properties in carbonates. **The Leading Edge, Journal of the Society of Exploration Geophysicists**, 30, n. 12, 30 December 2011. 1400-1407.

———, ———. **Simulation of carbonate rocks elastic properties using 3D X-Ray computed tomography images based on Discrete Element Method and Finite Element Method**. 46th US Rock Mechanics / Geomechanics Symposium held. Chicago: ARMA. 2012. p. -10.

KEYAK, J.H. ; MEAGHER, J.M.; SKINNER, H.B; MOTE, C.D. Automated three-dimensional finite element modelling of bone: a new method. **Journal of Biomedical Engineering**, v. 12, n. 5, p. 389–397, September 1990. ISSN 0141-5425.

KNACKSTEDT, M.; MADADI, M.; ARNS, C.; BAECHLE, G.; EBERLI, G.; AND WEGER, R. Carbonate Petrophysical Parameters Derived from 3D Images. **Search and Discovery**, San Antonio, Texas, p. 1-9, 20 March 2009. ISSN 40393.

LIN, C.; COHEN, M. H. Quantitative methods for microgeometric modelling. **Journal of Applied Physics**, v. 53, n. 6, p. 4152-4165, 1982. ISSN 00218979.

LNEC. **Correlação das propriedades mecânicas dos aços com a microestrutura**. Lisboa: Laboratorio Nacional de Engenharia Civil, v. 522, 1979.

LOPES, J. N. **Faciologia e Gênese dos Carnonatos do Grupo Bambuí na Região de Arcos, Estado de Minas Gerais**. Universidade de São Paulo - Instituto de Geociências. São Paulo, p. 1-180. 1995.

LORENSEN, W. E.; CLINE, H. E. Marching cubes: A high resolution 3D surface construction algorithm. **ACM Siggraph Computer Graphics**, New York, NY, USA, 21, n. 4, July 1987. 163-169.

LUCIA, F. J. Petrophysical Parameters Estimated From Visual Descriptions of Carbonate Rocks: A Fiels Classification of Carbonate Pore Space. **Journal of Petroleum Technology**, v. 35, n. 3, p. 629, 1983. ISSN 0149-2136.

———. Rock Fabric/Petrophysical Classification of Carbonate Pore Space for Reservoir Characterization. **AAPG Bulletin**, v. 79, n. 9, p. 1275-1300, September 1995. ISSN 0149-1423.

———. **Carbonate reservoir characterization**. Berlin: [s.n.], 1999. 1-226 p. ISBN 3540637826, 9783540637820.

MARTÍNEZ MARTÍNEZ, J. Influencia de la alteración sobre las propiedades mecánicas de calizas, dolomías y mármoles: evaluación mediante estimadores no destructivos (ultrasonidos)., Alicante, p. 1-295, 2008. ISSN 1885-7264. ua.es/dspace/bitstream/10045/9902/1/Tesis_Javier_Martinez.pdf.

———, J.; BENAVENTE, D.; GARCÍA-DEL-CURA, M. A. Spatial attenuation: The most sensitive ultrasonic parameter for detecting petrographic features and decay processes in carbonate rocks. **Engineering Geology**, v. 119, n. 3-4, p. 84-95, 09 maio 2011.

MAVKO, G.; MUKERJI, T.; DVORKIN, J. **The Rock Physics Handbook: Tools for Seismic Analysis in Porous Media**. Cambridge: Cambridge University Press, 1998. ISBN 0521620686 hardback.

MEYERS, D.; SKINNER, S.; SLOAN, K. Surfaces from contours. **ACM Transactions on Graphics**, New York, NY, USA, 11, n. 3, July 1992. 228-258.

MÜLLER, R.; RÜEGSEGG, P. Three-dimensional finite element modelling of non-invasively assessed trabecular bone structures. **Medical Engineering & Physics**, Great Britain, 17, n. 2, March 1995. 126-133.

MYFLORIDA.COM: THE STATE OF FLORIDA, DEPARTMENT OF MANAGEMENT SERVICES. MyFlorida.com. <http://www.dep.state.fl.us/geology/geologictopics/rocks/anastasia.htm>, 21 jan. 2010. Disponível em: <<http://www.dep.state.fl.us/>>. Acesso em: 18 out. 2012.

NOTARBERARDINO, B. et al. Image based simulation of large strain deformation of open celled foams. **Materials Evaluation**, Columbus, OH, ETATS-UNIS, 66, n. 1, January 2008. 60-66.

PENTECOST, A. **Travertine**. Berlin: Springer, 2005. 445 p. ISBN 978-1-4020-3606-4.

———; VILES, H. A. Review and Reassessment of Travertine Classification. **Géographie Physique et Quaternaire**, v. 48, n° 3, n. 10.7202/033011ar, p. p.305-314, 16 fev. 1994.

PETROBRAS-UFPR. Projeto Falhas. **http:** //www.projetofalhas.ufpr.br, 2012. Disponível em: <<http://www.projetofalhas.ufpr.br>>. Acesso em: 19 out. 2012.

PETTIJOHN, F. J. **Sedimentary rocks**. 2. ed. New York, N.Y.: Harper & Row, 1957.

———. **Sedimentary Rocks**. 3. ed. New York: Harper & Row, 1975. 628p.

PILOTTO, D. **Caracterização Geológica e Geomecânica de Travertinos**. Pontifícia Universidade Católica do Rio de Janeiro. Rio de Janeiro. 2011. (0921913/CB).

PINTO, O. Apuntes Petrologia-Sedimentaria-II. **http:** //es.scribd.com/doc/13047688/Petrologia-Sedimentaria-II, 06 mar. 2009. Acesso em: 16 out. 2011. Material Académico. Universidad Complutense de Madrid.

ROBERTS, A. P.; GARBOCZI, E. J. Elastic Properties of Model Porous Ceramics. **Journal of the American Ceramic Society**, 83, n. 12, December 2000. 3041–3048.

SABATAKAKIS, N.; KOUKIS, G.; TSIAMBAOS, G.; PAPANAKLI, S. Index properties and strength variation controlled by microstructure for sedimentary rocks. **Engineering Geology**, v. 97, n. 1-2, p. 80-90, 12 March 2008. ISSN 0013-7952.

SAENGER, E. H. Numerical methods to determine effective elastic properties. **International Journal of Engineering Science**, 46, n. 6, June 2008. 598–605.

SANDATLAS.ORG. Sandatlas.org. **http:** //www.sandatlas.org/2012/10/coquina/, 02 out. 2012. Disponível em: <<http://www.sandatlas.org>>. Acesso em: 18 out. 2012.

SCHLUMBERGER. Caracterización de los yacimientos fracturados: Modelos predictivos confiables para optimizar el desempeño de los yacimientos carbonatados. **http:** //www.slb.com/~media/Files/industry_challenges/carbonates/brochures/cb_caracterizacion_08os070.pdf, 2008. Disponível em: <www.slb.com>. Acesso em: 16 Outubro 2012.

SHARMAN, J. <http://www.exaflop.org/docs/marchcubes/>. Acesso em: 24 maio 2013.

SHULAKOVA, V.; PERVUKHINA, M.; MÜLLER, T. M.; LEBEDEV, M.; MAYO, S.; SCHMID, S.; GOLODONIUC, P.; DE PAULA, O. B.; CLENNELL, B.M.; GUREVICH, B. Computational elastic up-scaling of sandstone on the basis of X-ray micro-tomographic images. **Geophysical Prospecting**, v. 61, n. 2, p. 287-301, 14 February 2013. ISSN 0016-8025.

SIMPLEWARE LTD. <http://www.simpleware.com>. Acesso em: 27 June 2013.

———. **Reference Guide. version 5.1**. Exeter, UK. 2012.

———. **Tutorial Guide. Version 5.1. ScanIP, +FE Module, +CAD Module, +NURBS Module**. Exeter, UK: 2012 Simpleware Ltd., 2012.

SKYSCAN. CT-Volume Version 2.0. Manual: The User's Guide. 2008. p. 1-27.

———. Manual for SkyScan CT-Analyser v. 1.10: The User's Guide. 2010. p. 1-116.

SPANNEP.; THOVERT, J.; JACQUIN, J.; LINQUIST, W. B.; JONES, K.; COKER, D. Synchrotron computed microtomography of porous media: topology and transports. **Physical Review Letters**, v. 73, n. 14, p. 2001, October 1994. ISSN 0031-9007.

TÖRÖK, Á.; VÁSÁRHELYI, B. The influence of water content on the fabric of rock mechanical parameters, and travertine, examples of Hungary. **Engineering Geology**, 115, n. 3-4, 01 out. 2010. 237-245. Acesso em: 19 mar. 2013.

UNICAMP INOVAÇÃO. [Inovacao.unicamp](http://www.inovacao.unicamp.br). Acesso em: 09 nov. 2009. Disponível em: <<http://www.inovacao.unicamp.br/report/noticias/index.php?cod=642>>. Acesso em: 2012 set. 10.

UNIVERSIDAD DE CHILE. Descripción microscópica. http://mct.dgf.uchile.cl/AREAS/mine_mod231.pdf, 31 out. 2005. Disponível em: <<http://mct.dgf.uchile.cl>>. Acesso em: 16 out. 2012.

VILES, H. A.; GOUDIE, A. S. Tufas, travertines and allied carbonate deposits. **Geographical Work in the Natural and Environmental Sciences**, 14, n. 10.1177/030913339001400102, 1990.

WEGER, R. J. **Quantitative Pore/Rock Type in Carbonates and their Relationship to Velocity Deviations**. University of Miami. Coral Gables, Florida, p. 1-243. 2006. (UMI 3215240).

WIKIMEDIA.

Wikimedia.org.

http:

[//upload.wikimedia.org/wikipedia/commons/a/a9/CoquinaClose.jpg](http://upload.wikimedia.org/wikipedia/commons/a/a9/CoquinaClose.jpg), 24 jun. 2012.

Disponível em: <<http://commons.wikimedia.org>>. Acesso em: 18 out. 2012.

WORDEN, R. H.; BURLEY, S. D. **Sandstone Diagenesis: Recent and Ancient**. Oxford: International Association of Sedimentologists, 2003. 1 - 44 p. ISBN 1-4443-0445-3, 978-1-4443-0445-9.

YAGIZ, S. Overview on geo-mechanical assessments of Denizli travertines in Turkey. **In Proceedings of 10th International Association of Engineering Geologists Congress, Engineering Geology**, Tomorrows, n. 384, 2006. 1-7.

———. Predicting uniaxial compressive strength, modulus of elasticity and index properties of rocks using the Schmidt hammer. **Bulletin of Engineering Geology and the Environment**, 68, n. 1, February 2009. 55-63.

YEO, O.; YOUNG, P.; LAITY, P.; TABOR, G. CFD Simulation of Flow Through an Open Cell foam. **International Journal of Modern Physics. C, Computational Physics, Physical computation**, v. 19, n. 5, p. 703-715, May 2008. ISSN 0129-1831.

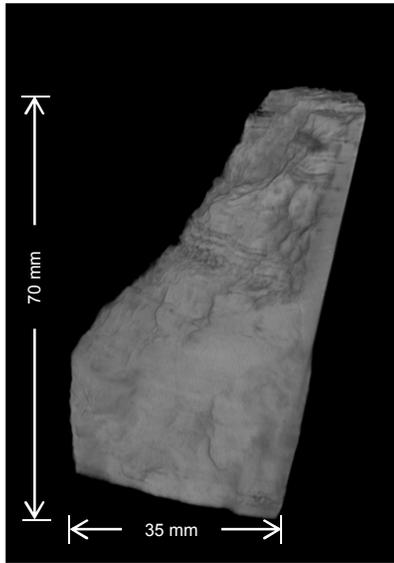
YOUNG, P. G.; BERESFORD-WEST, T. B. H.; COWARD, S. R. L.; NOTARBERARDINO, B.; WALKER, B.; AZIZ, A. ABDUL. An efficient approach to converting three-dimensional image data into highly accurate computational models. **Philosophical transactions of the Royal Society of London. Series A: Mathematical, Physical and Engineering sciences**, v. 366, n. 1878, p. 3155–3173, 13 September 2008. ISSN 1364-503x.

ZHAO, J.; ZHOU, B.; LIU, B.; GOU, W. Elasticity of Single-Crystal Calcite by First-Principles Calculations. **Journal of Computational and Theoretical Nanoscience**, v. 6, n. 5, p. 1181-1188, 5 March 2009. ISSN 1546-1955.

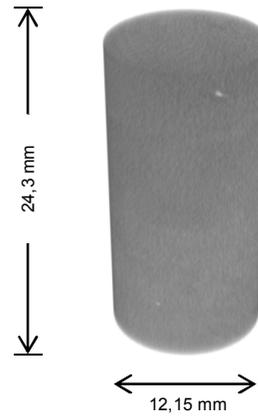
ZIMBRES, E. Dicionário Enciclopédico Livre de Geociências. **http://www.dicionario.pro.br/wiki/Recristalização**, 2012-2013. Disponível em: <<http://www.dicionario.pro.br>>. Acesso em: 01 nov. 2012.

Apêndice I

Sub-amostragem digital e modelos tridimensionais rocha-poro

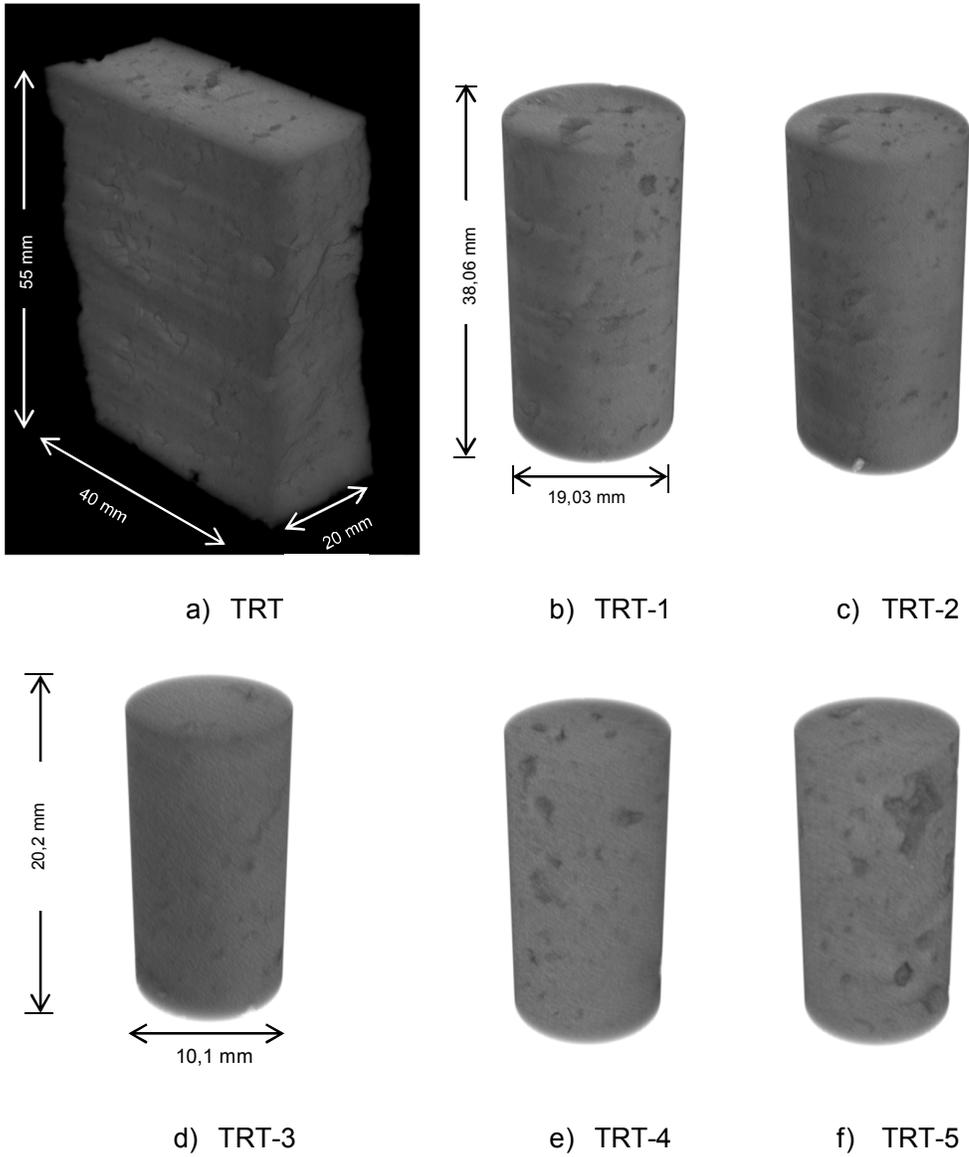


a) TRI



b) TRI-1

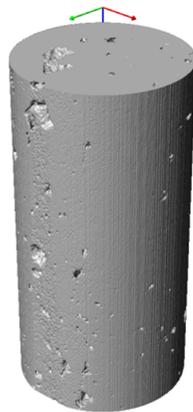
Apêndice I. 1. Sub-amostragem: a) Imagem 3D da amostra irregular do travertino Romano microtomografado. b) Sub-amostra TRI-1.



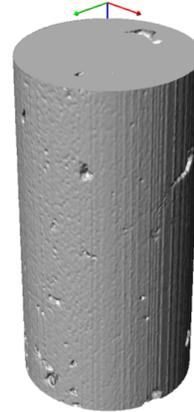
Apêndice I. 2. Sub-amostragem: (a) Imagem 3D da amostra irregular do travertino Turco microtomografado; (b), (c), (d) e (e) Sub-amostras cilíndricas.



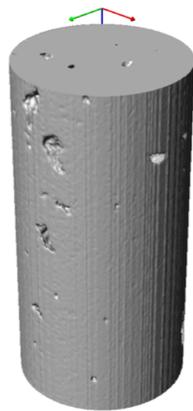
TRT-1



TRT-2



TRT-3



TRT-4

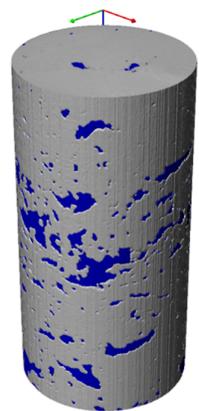
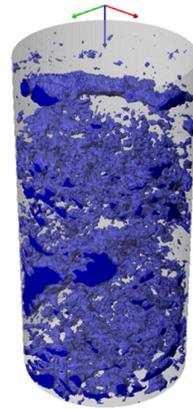


TRT-5

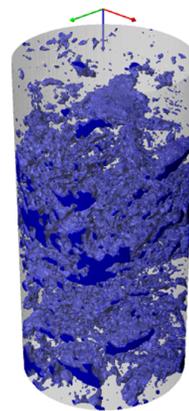
Apêndice I. 3. Modelos tridimensionais (volume cilíndrico) das sub-amostras do travertino Turco.



TRR-2



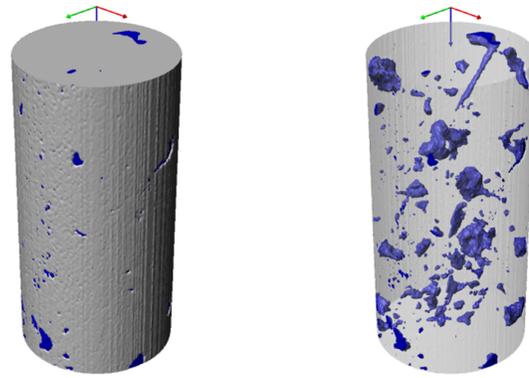
TRR-3



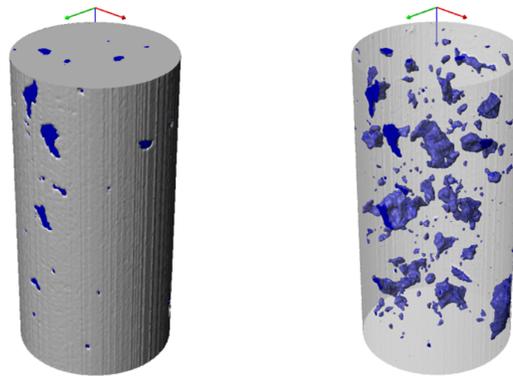
a)

b)

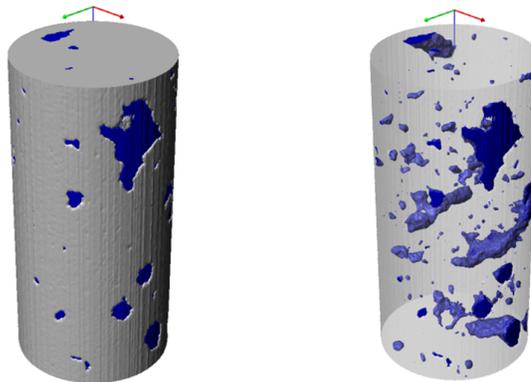
Apêndice I. 4. Visualização 3D, sub-amostras TRR-2 e TRR-3 a) Visualização externa modelos rocha e poros, b) visualização do sistema poroso interno.



TRT-3



TRT-4



TRT-5

a)

b)

Apêndice I. 5. Visualização 3D, sub-amostras TRT-3, TRT-4 e TRT-5 a) Visualização externa modelos rocha e poros, b) visualização do sistema poroso interno.