

PROFILE

Name: Sait Ismail Ozkaya, Ph. D.
Geological consultant



Picture was taken in 2012 at grandma's water well- long gone.

Sait Ismail Ozkaya is a structural geologist with a Ph. D. degree from the University of Missouri USA. He also has an M.Sc, degree in Computer Science and strong background mathematics and computer programming. He was a professor at Kuwait University before he joined Baker Atlas in 1996. He has been working an independent consultant since 2003.

His specialty is fractured reservoir characterization. He has worked on a vast number of fractured carbonate and clastic reservoirs in the Middle East. His work covers full spectrum from borehole image interpretation to fracture data generation for single or dual porosity reservoir simulation. He has been particularly successful in evaluating fracture flow patterns by integrating petroleum engineering data with geological fault/fracture information. He has used a wide range of software and techniques such as 2D and 3D Discrete fracture network modeling and prediction with Neural Networks. He has written several software packages for fracture analysis and has many publications in structural geology, computer applications and fracture analysis. Below his projects, recent publications and SPE presentation are listed.

FRACTURED RESERVOIR PROJECTS

An image log based interpretation of volcanic maar- [Qahar Field](#), Deir az Zor, Syria, 1996 (with Joerg Mattner).

Fractured reservoir characterization- [North Uthmaniyah Field](#), S. Aramco, S. Arabia, 1996-1998 (with Joerg Mattner and Jonathan Strauss).

Fracture interpretation from borehole image logs- [Berri Field](#), S. Aramco, S. Arabia, 1998-1999. (with Joerg Mattner)

Fractured reservoir study-[Abqaiq Field](#), S. Aramco, S. Arabia, 1997-1999.

Structural modeling and fracture flow potential-[Sarmad and Harweel](#), Petroleum Development Oman, Oman, 1998.

Structural modeling and fractured reservoir characterization- [Makarem Field](#), Petroleum

Development Oman, Oman, 1998 (with Joerg Mattner).

Integrated image analysis- [Ghafeer](#), Petroleum Development Oman, Oman, 1998.

Integrated fractured study- [Marmul/Haima West](#), Petroleum Development Oman, Oman, 1999-2000 (with Joerg Mattner).

Integrated fracture studies from cores and image logs- [Ara stringers, South Oman](#), Petroleum Development Oman, Oman, 2000 (with Joerg Mattner).

Core fracture study- [Birba Field](#), Petroleum Development Oman, Oman, 2000-2001(with Joerg Mattner).

Integrated fracture study- [Fahud Field](#), Petroleum Development Oman, Oman, 2001.

Integrated fracture study- [Dhulaima Field](#), Petroleum Development Oman, Oman, 2001.

Fracture study from image logs- [Lekhwaier A North Field](#), Oman. Petroleum Development Oman, Oman, 2001.

Integrated fracture study- [Lekhwaier B and C Field](#), Petroleum Development Oman, Oman, 2002.

Fractured reservoir characterization- [Natih Field](#), Petroleum Development Oman, Oman, 2002.

Fractured reservoir characterization- [Yibal Field](#), Petroleum development Oman, Oman, 2002.

Fractured reservoir characterization using dynamic data- [Lekhwaier –A North Field](#), Petroleum Development Oman, Oman, 2003.

Assessment of fracture flow potential from image logs, cores and dynamic data-[Nimr Field](#), Petroleum Development Oman. Oman, 2003-2004.

An Integrated study of karstic fracture Zones, tectonic fractures and compaction, Natih-A Reservoir-[Yibal Gas Field](#), Petroleum development Oman, Oman, 2004.

Fracture characterization from a horizontal well, and a vertical well using image logs, well tests and near borehole simulation- Mishrif reservoir, [Minagish Field](#), KOC, Kuwait, 2004.

Integrated fracture study- [Central Uthmaniyah Field](#), S. Aramco , S. Arabia, 2005.

Fracture interpretation of 3 horizontal wells- [Ghaba Field](#), North Oman, Petroleum Development Oman, Oman, 2005.

Fractured reservoir characterization from dynamic data update- [Lekhwaier A-North Field](#), Petroleum Development Oman, Oman 2006.

Uthmaniyah full field integrated fracture study using static and dynamic data- [Uthmaniyah Field](#), S. Aramco, S. Arabia, 2005.

Hawiyah integrated fracture study using image logs, well tests and dynamic data- [Hawiyah Field](#), S. Aramco, S. Arabia, 2006.

Integrated fracture study- [Aindar- Shedgum Fields](#), S. Aramco, S. Arabia, 2007

Structural Impact on the [Kauther Reservoir](#) Oman, PDO, 2008 (with Joerg Mattner)

Fracture flow potential of [basement reservoir](#) for SINOPEC phase I, Yemen 2008

Evaluation of fracture flow potential, [Khuff reservoir, Yibal Field](#) Oman, PDO 2008 (with Joerg Mattner)

Fractured reservoir study, [Daleel field](#) Oman. Daleel Oil Co. Oman 2008/

Integrated fracture modeling [Haradh Field](#), S. Aramco 2009

Fractures of [Khurais Field](#), S. Aramco 2009

Integrated fracture study- [Aindar- Shedgum Fields phase II](#), S. Aramco, 2010

Fracture study-Northern Fields ([Qursaniya, Fadhili and Abu Hadriya](#)), S. Aramco 2010

Fracture flow potential of [basement reservoir](#) for SINOPEC phase II, Yemen 2008

Reevaluation of structure and fractures- [Al Ghubar South](#), PDO 2011- (with Joerg Mattner)

Reevaluation of structure and fractures- [Al Ghubar Main](#), PDO 2011- (with Joerg Mattner)

Fracture analysis of Ratawi carbonates [in Marjan field](#), S. Aramco 2012.

[Berri Field](#) Fracture study, S Aramco, 2012.

Late time, deep burial diagenesis and relation to fractures, [Hawiyah Field](#), S. Aramco 2013.

[Manifa Field](#) comprehensive fracture study, S. Aramco 2013.

Predictive fracture modeling of four field in S. Arabia based structural geology and geomechanics: [Khurais, Khursaniyah, Fadhili and Hawiyah](#), S. Aramco 2014

[West Adiyaman fields](#), fractured Sayindere reservoir study, Turkish Petroleum, 2014 (completed)

Shahd F and G Fields Fracture study, CCED Oman 2015

Shahd H Field fracture study, CCED Oman 2015.

Predictive fracture modeling revisited, S. Aramco, May-June 2017.

Assessment of **Khufai and Buah** fractured reservoirs using borehole images, wireline logs and production performance, CCED Oman, June-July 2019

SHORT COURSES

An integrated approach to deterministic modeling of fracture corridors

(3 days)

PDO 2008

PDO 2009

KOC 2010

Structural geology from a time perspective

(3 days)

TPAO 2010

S. Aramco 2010

Predictive fracture modeling

(4 days)

TPAO 2010

Structural geology from a time perspective

TPJD January-February 2013 (repeated twice)

Fractured reservoir modeling

TPJD February 2013 (repeated twice)

Fracture analysis and modeling from static and dynamic data

May 18 to 25, 2014 -S. Aramco

May 14 to 19, 2016 -S. Aramco

May 14 to 19, 2017 -S. Aramco

PUBLICATIONS

Ozkaya, S. I., 1982. Marginal basin ophiolites at Oramar and Karadag, SE Turkey. *Journal of the Geological Society*, v. 139, p. 203-210.

Ozkaya, S. I., 1982. Upper Cretaceous plate rupture and development of leaky transcurrent fault ophiolites in southeast Turkey. *Tectonophysics*, v. 88, p. 103-116.

Ozkaya, S. I., 1986. Analysis of factors influencing excess heads in shales during burial. *Marine and Petroleum Geology*, v. 3, p. 74-78.

Ozkaya, S. I., 1988. A simple analysis of primary oil migration through oil-propagated fractures. *Marine and Petroleum Geology*, v.5 p. 170-174.

Ozkaya, S. I., 1988. A simple analysis of oil-induced fracturing in sedimentary rocks. *Marine and Petroleum Geology*, v. 5, p. 293-297.

Ozkaya, S. I., 1989. Fluid flow equations governing primary oil migration as a separate phase/ *Marine and Petroleum Geology*, v. 6, p. 370-375.

Ozkaya, S. I., 1990. Origin of the allochthons in the Lycien belt, Southwest Turkey. *Tectonophysics*, v.177, p.367-379.

Ozkaya, S. I., and Akbar, A., 1991. An iterative procedure to determine depth and time of primary oil migration and expulsion efficiency of source rocks *Journal of Petroleum Science and Engineering*, v. 5, p.371-378.

Ozkaya, S. I., 1994, Two Autolisp routines to aid manual construction of a balanced cross section. *Computers & Geosciences*, v. 20, p. 425-432

Ozkaya, S. I., 1994., Two Excel macros for tracing deviated boreholes using cubic splines and calculation of formation depth and thickness. *Computers&Geosciences*, v. 21, p. 851-858/

Ozkaya, S. I., 1996, An Excel macro for importing log ascii standard (LAS) files into Excel worksheets. *Computers&Geosciences*, v. 22, p. 75-80.

Ozkaya, S. I., and Mattner, J., 1996, Drag- An Excel visual basic program for modeling fault drag using cubic splines and calculation of minimum dip and strike separation. *Computers & Geosciences*, V. 22, p. 517-524.

Ozkaya, S. I. 2002, CURVAZ- A Program to Calculate Magnitude and Direction of Maximum Structural Curvature and Fracture-flow Index. *Computers & Geosciences*, v. 28, p. 399-407.

Ozkaya, S. I., 2002, KINKFOLD - An AutoLISP Program for Construction of Geological Cross Sections Using Borehole Image Data. *Computers & Geosciences*, v. 28, p.409-420.

- Ozkaya, S. I., 2002, QUADRO– A Program to Estimate Principal Curvatures of Folds. *Computers & Geosciences*, v. 28, p. 467-472.
- Ozkaya, S. I., 2003, Fracture Length Estimation from Borehole Image Logs. *Mathematical Geology*, v. 35, p. 737-753.
- Ozkaya, S. I, and Mattner, J., 2003, Fracture Connectivity from Fracture Intersections in Borehole Image Logs. *Computers & Geosciences*, v. 29, p. 143-153.
- Ozkaya, S.I. and Richard, P., 2006, Fractured Reservoir Characterization using Dynamic Data in a Carbonate Field, Oman. *SPE Reservoir Evaluation & Engineering*. P.227-238.
- Ozkaya, S. I., Lewandowski, H. J., Coskun S.B., 2007, Fracture Study of a Horizontal Well in a Tight Reservoir – Kuwait. *Journal of Petroleum Science and Engineering Special Publication*. V. 55 p.6-17.
- Ozkaya, A. I., and Minton, K. R., 2007, Flow Potential of Fracture Corridors and Large Conductive Fractures in a Clastic Field, Oman. In Lonergan, L, Jollym R., J. H., Rawnsley, K & Sanderson, D. J (Eds) *Fractured Reservoirs*. Geological Society London, Special Publications, 270, p. 245-263.
- Ozkaya, S. I., 2008. Using probabilistic decision trees to detect fracture corridors from dynamic data in mature oil fields. *SPE Reservoir Evaluation & Engineering*, December 2008 1061-1070.
- Ozkaya, S. I., 2010. Use of exclusion zones in mapping and modeling fracture corridors. *SPE Reservoir Evaluation & Engineering*, August 2010, 679-687.
- Ozkaya, S. I., 2011. A simple formula to estimate fracture connectivity. *SPE Reservoir Engineering & Evaluation*. December 2011, 763-775.
- Ozkaya, S. I. 2014, SUPERPOSE- An Excel Visual Basic Program for Fracture Modeling Based on the Stress Superposition Method. *Computers & Geosciences*. 64 41-51.
- Ozkaya, Sait. 2017. Modeling Finite-Fracture Networks in a Partially Fractured Reservoir in the Middle East. *SPE Reservoir Evaluation & Engineering-Formation Evaluation*. SPE-185171-PA (in press; posted 9 May 2017).
- Ozkaya, S. I., 2018. FRACOR-software toolbox for deterministic mapping of fracture corridors in oil fields on AutoCAD platform. *Computers and Geosciences* 112 (2018) 9–22.
- Al-Fahmi, M.M., Ozkaya, S.I., and Cartwright, J.A., 2018. New insights on fracture roughness and wall mismatch in carbonate reservoir rocks: *Geosphere*, v. 14, no. 4, p. 1851-1860.

Ozkaya, S., Dölek, T., Yapan, K., and Durukan, B.A., 2019. Controls on fracture flow potential in a tight carbonate reservoir: Sayindere formation (Campanian), West Adiyaman basin, SE Turkey. *Journal of Petroleum Geology*. V. 42, p.207-228. <http://dx.doi.org/10.1111/jpg.12730>

Ozkaya, Sait I. 2019. Validating Predicted Fracture Corridors by Statistical Comparison With Well Data. *SPE Reservoir Evaluation & Engineering-Formation Evaluation*. SPE-195582-PA. <https://doi.org/10.2118/195582-PA>.

Özkaya, S. I., 2019. Fracture modeling from borehole image logs and water invasion in carbonate reservoirs with layer-bound fractures and fracture corridors. *Journal of Petroleum Science and Engineering*. 179, 199–209. <https://doi.org/10.1016/j.petrol.2019.04.052>

FRACTURE RELATED PAPERS PRESENTED IN RECENT CONFERENCES

SPE Conferences

Ozkaya, S. I., Minton, K., 2005, Flow Potential of Fracture Corridors and Large Conductive-Fractures in a clastic Field, Southern Basin-Oman. [SPE 93030](#), MEOS 2005 Bahrain,

Ozkaya, S. I., P. Richard, P., 2005, Fractured Reservoir Characterization Using Dynamic Data in A Carbonate Field, Oman. [SPE 93312](#), MEOS 2005, Bahrain.

Ozkaya, S. I., 2005, Integrated fracture analysis- Three brief case studies. [SPE 106333](#), SPE Technical Symposium, S. Arabia.

Ozkaya, S.I., and Bolle, L., 2006, Modeling and Upscaling Fracture Corridors – Uncertainties. [SPE 106337](#), SPE Technical Symposium, S. Arabia.

Ozkaya, S, I., Richard P. and Mueller, G., 2006, Estimating Percentage of Fracture Fairways Detectible by Seismic Data- Case Studies from Oman. [SPE 100449](#), ADIPEC 2006, Abu Dhabi.

Ozkaya, S. I. , Gordon, S., McFarlane, A., Siyabi, S. Al-Busaidi, S.M., Kramer, M.F., Coskun, S.B., and Bolle, L. 2007, Devising Knowledge Based Decision Tree for Detection of Fracture Corridors from Dynamic Data in a Carbonate Reservoir in Oman. [SPE 105015](#), MEOS 2007, Bahrain.

Ozkaya, S. I., 2007, Detection of Fracture Corridors from Openhole Logs in Horizontal wells. [SPE 110942](#), SPEKSA Technical Symposium, Dhahran, S. Arabia.

Ozkaya, S. I. and Siyabi, S., 2008, Detection of Fracture Corridors from Dynamic Data by Factor Analysis. [SPE 08001](#), SPEKSA Technical Symposium, Dhahran, S. Arabia.

Ozkaya, S. I. 2010, Use of Exclusion Zones in Mapping and Modeling Fracture Corridors, [SPE 120136](#). SPEKSA Technical Symposium, Dhahran, S. Arabia.

Ozkaya, S. I., 2011. A Simple Formula to Estimate Fracture Connectivity, [SPE 149081](#). SPE/DGS Saudi Arabia Section Technical Symposium and Exhibition, 15-18 May 2011 Al Khobar, S. Arabia.

Ozkaya, S.I., 2012. Stress Superposition Explains Fracture Patterns in some Middle East Oil Fields. [SPE-SAS-76](#). SPE Saudi Arabia Section Technical Symposium and Exhibition held in AlKhobar, Saudi Arabia, 8–11 April 2012.

Thagafy,M., Subaie, S., Ozkaya, S. 2017. Predictive Fracture Modeling: Example Fields From Saudi Arabia. [SPE-189049-MS](#). [SPE Annual technical Symposium, Dammam, 24-27 April](#).

Other International Conferences

Kolkman, W., Ozkaya, S. I., Harris, K., 2002, Mechanical layer and fault control on fracturing in Natih reservoir, Fahud Field, North Oman. [Geo2002, AAPG Regional Exhibition, March 2002, Bahrain.](#)

Ozkaya, S. I., Kolkman, W., and Amthor, J., 2003, Mechanical layer-dependent fracture characteristics-examples from carbonate reservoirs, North Oman. [AAPG Convention, September, 2003 Barcelona.](#)

Ozkaya, I. S., and Harris, K., 2004, Origin and evolution of Lekhwair and Dhulaima structures, North Oman basin. [Geo2004, AAPG Regional Exhibition, March 2004, Bahrain.](#)

Ozkaya, S.I., and Mueller, G., 2004, Thief zones are not fractured layers in the Yibal field, North Oman. [Geo2004, AAPG Regional Exhibition, March 2004, Bahrain.](#)

Ozkaya, S. I., Minton, K., 2004, Investigation of flow potential of fracture corridors and mega-fractures in a clastic field in South Oman. [Fractured Reservoir Conference, , The Geological Society, Nov17-19 2004, London.](#)

Ozkaya, S. I., Klaus, J. 2007, Detection of Fracture Corridors from Openhole Logs in Horizontal Wells, [First SPWLA India Regional Symposium, 19-20th March 2007 Mumbai.](#)

Taghafy, M., Ozkaya, S.I. 2014. Deep burial diagenesis of a carbonate reservoir. [AAPG Conference and Exhibition in Bahrain 10-13 March 2014.](#)

Al-Fahmi M.M., Ozkaya, S. I., J.A. Cartwright, 2017. Measurements on Fracture Roughness from Carbonate Reservoirs. [Conference: 79th EAGE Conference and Exhibition 2017](#)