



## Stress Field of the Earth's Crust

By Arno Zang, Ove Stephansson



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Stress Field of the Earth's Crust is based on lecture notes prepared for a course offered to graduate students in the Earth sciences and engineering at University of Potsdam. In my opinion, it will undoubtedly also become a standard reference book on the desk of most scientists working with rocks, such as geophysicists, structural geologists, rock mechanics experts, as well as geotechnical and petroleum engineers. That is because this book is concerned with what is probably the most peculiar characteristic of rock – its initial stress condition. Rock is always under a natural state of stress, primarily a result of the gravitational and tectonic forces to which it is subjected. Crustal stresses can vary regionally and locally and can reach in places considerable magnitudes, leading to natural or man-made mechanical failure. Pre-existing stress distinguishes rock from most other materials and is at the core of the discipline of “Rock Mechanics”, which has been developed over the last century. Knowledge of rock stress is fundamental to understanding faulting mechanisms and earthquake triggering, to designing stable underground caverns and productive oil fields, and to improving mining methods and geothermal energy extraction, among others. Several books have been written on the subject, but none has attempted to be as all-encompassing as the one by Zang and Stephansson.

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## Stress Field of the Earth's Crust By Arno Zang, Ove Stephansson Bibliography

- Sales Rank: #3678245 in Books
- Published on: 2010-03-23
- Original language: English
- Number of items: 1
- Dimensions: 9.21" h x .81" w x 6.14" l, 1.60 pounds
- Binding: Hardcover
- 324 pages

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### Editorial Review

Review

Endorsements:

"The book thoroughly and convincingly integrates in situ stress, its sources, measurement, and applications, into the fields of geophysics, geology, geomechanics, and geoengineering. It is therefore that I enthusiastically recommend Stress Field of the Earth's Crust."

(Bezalel Haimson, University of Wisconsin, Madison, USA, June 2009)

"I think it is a very good text that covers the most important aspects of the Kaiser effect, its mechanisms and how it can be used for stress measurements in rocks."

(Alexandre Lavrov, SINTEF Petroleum Research, Norway)

"It is beautifully laid out, easy to read, and impossible not to understand!. I especially like the way that many of the diagrams have such iconic simplicity so that the extraneous detail has been removed - leaving only the message that the diagram is transmitting."

(John A. Hudson, Emeritus Professor, Imperial College, UK, President, International Society for Rock Mechanics)

From the reviews:

"The presentation of the book is clear, with an abundant bibliography. ... I found the Note boxes that summarize important results to be particularly welcome. ... In conclusion, this book is undoubtedly focused on stress field of the Earth crust. ... I definitely would recommend this book to Earth Scientists in need to better understanding of stress measurement techniques, and to Rock Mechanics engineers who want to improve their understanding of the stress field at the scale of plate tectonics." (François Henri Cornet, International Journal of Rock Mechanics and Mining Sciences, September, 2010)

From the Back Cover

This book about rock stress is suitable for students in geosciences and rock engineering, who need to broaden their horizons about the Stress Field of the Earth's Crust. The book covers the topic so that geosciences students will be able to grasp the Cauchy Stress Principle without fear of matrix transformations in an exercise. Students interested in mathematics, physics and engineering will learn how strain gauges are used to obtain in-situ stress by the overcoring method. Leading edge technology in determining rock stress like quadruple packer and the Kaiser effect are presented together with classical methods like hydraulic fracturing. Borehole techniques (breakouts) and core-based methods (anelastic strain recovery) are illustrated. With respect to stress data, we choose to present the scientific ultra-deep drilling project KTB (Germany), the excavation for nuclear waste disposal at Olkiluoto (Finland) and the drilling into a seismic active fault zone at SAFOD (USA). Stress compilations viewed by the World Stress Map project are presented and interpreted in terms of plate tectonics.

## Users Review

### From reader reviews:

#### Gary Glover:

Reading a publication tends to be new life style in this particular era globalization. With studying you can get a lot of information that will give you benefit in your life. With book everyone in this world could share their idea. Ebooks can also inspire a lot of people. A lot of author can inspire their very own reader with their story or their experience. Not only the storyplot that share in the ebooks. But also they write about advantage about something that you need example of this. How to get the good score toefl, or how to teach your kids, there are many kinds of book that you can get now. The authors in this world always try to improve their talent in writing, they also doing some investigation before they write to their book. One of them is this Stress Field of the Earth's Crust.

#### Mary Davis:

Reading can called mind hangout, why? Because if you find yourself reading a book mainly book entitled Stress Field of the Earth's Crust your brain will drift away trough every dimension, wandering in every single aspect that maybe mysterious for but surely can become your mind friends. Imaging every single word written in a reserve then become one form conclusion and explanation in which maybe you never get just before. The Stress Field of the Earth's Crust giving you another experience more than blown away your thoughts but also giving you useful data for your better life in this era. So now let us demonstrate the relaxing pattern at this point is your body and mind will probably be pleased when you are finished reading it, like winning a sport. Do you want to try this extraordinary investing spare time activity?

#### Bertha Greene:

This Stress Field of the Earth's Crust is brand-new way for you who has intense curiosity to look for some information mainly because it relief your hunger of information. Getting deeper you onto it getting knowledge more you know otherwise you who still having small amount of digest in reading this Stress Field of the Earth's Crust can be the light food to suit your needs because the information inside this book is easy to get through anyone. These books create itself in the form and that is reachable by anyone, yep I mean in the e-book application form. People who think that in reserve form make them feel drowsy even dizzy this publication is the answer. So you cannot find any in reading a guide especially this one. You can find actually looking for. It should be here for an individual. So , don't miss the idea! Just read this e-book variety for your better life along with knowledge.

#### Samantha Smith:

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ways to get whatever we would like. Likewise word says, ways to reach Chinese's country. Therefore this Stress Field of the Earth's Crust can make you truly feel more interested to read.

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