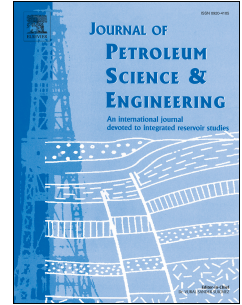


Accepted Manuscript

An adaptive pluri-Gaussian simulation model for geological uncertainty quantification

Bogdan Sebacher, Remus Hanea, Andreas S. Stordal



PII: S0920-4105(17)30050-5

DOI: [10.1016/j.petrol.2017.08.038](https://doi.org/10.1016/j.petrol.2017.08.038)

Reference: PETROL 4201

To appear in: *Journal of Petroleum Science and Engineering*

Received Date: 5 January 2017

Revised Date: 26 July 2017

Accepted Date: 15 August 2017

Please cite this article as: Sebacher, B., Hanea, R., Stordal, A.S., An adaptive pluri-Gaussian simulation model for geological uncertainty quantification, *Journal of Petroleum Science and Engineering* (2017), doi: 10.1016/j.petrol.2017.08.038.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

An Adaptive Pluri-Gaussian Simulation Model for Geological Uncertainty Quantification

Bogdan Sebacher, Remus Hanea and Andreas S. Stordal

August 23, 2017

Abstract

1
2 In the reservoir exploration phase, different types of information are gathered and
3 used for a reliable geological description. Combining seismic data, well log analysis,
4 statistical rock physics or even paleobathymetry ranges, several methods have been
5 proposed to estimate a probability field for each facies type in the reservoir model.
6 However, these probability fields are typically not conditioned to the reservoir produc-
7 tion history. Once the reservoir starts production new information becomes available,
8 and an update of the probability fields is needed. The work presented here introduces
9 a new framework for simulation of facies fields in the context of plurigaussian simu-
10 lation where the facies fields are conditioned to the prior probability fields provided.
11 The methodology is based on the probability integral transform and the topological
12 characteristics of the facies types (number of the facies type and relative position
13 among facies types). The **developed method** generates an ensemble of facies fields
14 that honor the facies distribution as described by a probability field. The proposed
15 method can easily condition the facies field to hard data and preserve the facies field
16 during history matching in an ensemble based framework. A demonstration with the
17 adaptive Gaussian mixture filter is presented here.

18 Keywords: Plurigaussian truncation, probability fields for facies distribution, ensem-
19 ble methods, Assisted History Matching, geological realistic updates

Download English Version:

<https://daneshyari.com/en/article/5484062>

Download Persian Version:

<https://daneshyari.com/article/5484062>

[Daneshyari.com](https://daneshyari.com)