**Paper 19**

# Improved characterisation of carbonate reservoirs using non-linear modelling

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Physical properties of reservoir rocks such as type of lithofacies, porosity and permeability, are directly related to the recoverable volumes of hydrocarbons. Therefore it is important to determine these properties as accurate as possible. These properties however, can only be directly measured on cores of which, for economic reasons, only a limited number are available for a gas/oil field. Open hole logs on the other hand, are available in most wells and therefore it is common practice to derive the reservoir properties by calibrating the log responses to the core measured properties.

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Common techniques such as multi-variate linear regression are not always successful for carbonate reservoirs due to diagenetic effects that can strongly affect the relationship between reservoir properties such as porosity and permeability.

To improve the determination of carbonate reservoir properties from logs, the use of non-linear modelling was investigated with commercially available PC based software. Use of this user-friendly technique has proved useful in the prediction of the type of lithofacies and reservoir permeability and results in a better estimate of reservoir properties.