

## **A NEW APPROACH TO MEASURE EFFECTIVE ATOMIC NUMBER OF COMPLEX LITHOLOGIES BY LOGS.**

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Over the years measurements of the effective atomic number ( $Z_{\text{eff}}$ ) of complex lithologies has been deployed in both efficient and inefficient ways by the photoelectric index determination known as Pe-value. It is part of the spectral gamma-gamma density log in Litho-density tool (LDT). However the problem at hand has sometimes unsuccessful application due to inaccurate correlation between the low-to-high energy window counting rate ratio and the Pe-value weighed in a specified volume of rock surrounding the well. In the present work I propose a more accurate and efficient theoretical method based on the finite element method. The idea is to correlate the counting rate at low energy window of the far detector of LDT sonde with a lithological parameter given by the product of the density and the unknown squared atomic number of the formation. As a result synthetic logs are run in complex formations. It can be shown that enhancements are obtained concerned with the best acquisition processing sequence used.