**The Application of Poisson Impedance using target correlation coefficient analysis (TCCA) method for lithology discrimination and fluid identification: Case study of a Niger delta sedimentary basin, Nigeria.**

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**ABSTRACT.**

In this study we have shown the use of Poisson Impedance (PI) in the separation of sandstone reservoir from shale where the reservoir sandstone has similar P-, S- impedance contrast. We have adopted the Target Correlation Coefficient Analysis (TCCA) method introduced by Tian, *et al.* (2010) to calculate *c*. The correlation coefficients between PI curve with different *c* values versus Gamma ray (GR) curve and Water Saturation (Sw) curve are computed. The *c* value which gave the maximum correlation coefficient for GR and Sw were used to derive two new attributes namely Lithology impedance (LI) and Fluid Impedance (FI) respectively. The *c* value for LI is 1.324 at maximum correlation of 0.7580 and that for FI is 1.296 at maximum correlation of 0.6329. These new attributes are used specifically with its sensitivity with the LI, GR crossplot discriminating lithology and the FI, Sw crossplot identifying fluid effect. The derived volumes of the LI and FI from the prestack data have similar trend with their well counterpart hence attesting to PI being a favorable tool in reservoir characterization in the study field.

**Keywords**: attributes, crossplot, *c* value, Poisson Impedance