

# **Using Intraclass Correlation Coefficient and Bartlett Test Statistic to Identify Soil Layer Boundaries**

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## **ABSTRACT**

*In this study, the performance of two statistical methods, namely intraclass correlation coefficient (RI) and Bartlett test statistic in conjunction with various suggested window widths are investigated to identify soil layer boundaries. The study is done using three fairly different CPT soundings obtained from the database of National Geotechnical Experimental Sites. The identification of layer boundaries and demarcating the soil profile into homogeneous layers is very important in geotechnical engineering. From this study, RI appears to be a more powerful, robust and persistent tool and the corresponding suitable window width was proven as a function of average*

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*distance between boundaries which could be determined from autocorrelation analysis. Furthermore, a simple approximate method is also proposed in this study to estimate the suitable window width using the concept of average distance between 'mean-crossings'. The approach was exploited and substantiated as a simple, quick and accurate estimator in making the first approximation on suitable window width for boundary identification exercise.*

**Keywords:** *Soils; Boundary layers; Homogeneity; Statistics; Stationary processes.*