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(54) Title: ANOMALY DETECTION OF RADIOLOGICAL SIGNATURES

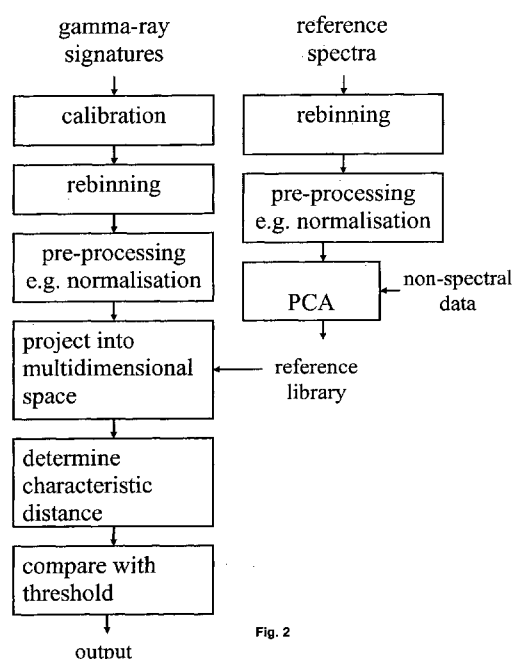


Fig. 2

(57) Abstract: Described herein is a method for determining the presence or absence of anomalous radioactive materials in a target in a detection zone. In the method, a target gamma ray spectrum is obtained from the target and a target data set is prepared from the target gamma ray spectrum. This data set comprise a plurality of intensity values, each intensity value being associated with an energy bin representing a gamma ray energy or range of gamma ray energies in the target gamma ray spectrum. The target data set is then pre-processed and projected into a principal component space which contains a pre-processed data library projected into the principal component space. A distance is then determined between the projected pre-processed target data set and one or more clusters of the projected pre-processed data library in the principal component space and this distance is compared with a predetermined threshold distance so as to determine if an anomalous radioactive material is present in the target.