## Intelligent interpretation of gravity data via a fuzzy approach for detecting subsurface cavities

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We aim to use an intelligent way of gravity data interpretation via a fuzzy approach. In this way we used a set which describes the nature of the cavities in 3 main shapes: sphere, vertical cylinder and horizontal cylinder, in real condition the cavities have not completely these shapes, so we used the fuzzy expression of 'near to' for the real shape of the cavities .So a fuzzy set was used for the cavity shape: near to sphere, near to vertical cylinder and near to horizontal cylinder. Using geological prior information, as a first estimation was applied and then we extracted the fuzzy rules for interpretation. The output of the designed fuzzy system is the shape of the cavity and its depth estimation. To test the innovated algorithm we used a set of real gravity data of some subsurface cavities and compared the results by the real values, it presented a good adoption.

Keywords: Fuzzy approach, Gravity, exploration, cavity