Shale Gas reservoirs characterization using neural network

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In this paper, a tentative of shale gas reservoirs characterization enhancement from well-logs data using neural network is established. The goal is to predict the Total Organic carbon (TOC) in boreholes where the TOC core rock or TOC well-log measurement does not exist. The Multilayer perceptron (MLP) neural network with three layers is established. The MLP input layer is constituted with five neurons corresponding to the Bulk density, Neutron porosity, sonic P wave slowness and photoelectric absorption coefficient. The hidden layer is forms with nine neurons and the output layer is formed with one neuron corresponding to the TOC log. Application to two boreholes located in Barnett shale formation where a well A is used as a pilot and a well B is used for propagation shows clearly the efficiency of the neural network method to improve the shale gas reservoirs characterization. The established formalism plays a high important role in the shale gas plays economy and long term gas energy production.