

NANOTAGS FOR IMPROVED CUTTINGS DEPTH CORRELATION

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Authors : Martin E. Poitzsch, S. Sherry Zhu, and Marta Antoniv (Aramco Research Center);
Nouf M. Aljabri and Alberto F. Marsala (Saudi Aramco)

Speaker : Martin E. Poitzsch

Abstract:

During a drilling operation, rock cuttings are often sampled off a shale shaker for lithology and petrophysical characterization. These analyses play an important role in describing the subsurface; and it is important that the depth origin of the cuttings be accurately determined. Traditionally, mud-loggers determine the depth origin of the sampled cuttings by calculating the lag time required for the cuttings to travel from the bit to the surface. These calculations, however, can contain inaccuracies in the depth correlation due to the shuffling and settling of cuttings as they travel with drilling fluid to the surface, due to unplanned conditions like drilling an overgauge hole, and due to other unforeseen drilling events, especially critical in horizontal sections. We therefore aimed to remedy these inaccuracies by developing a series of styrene-based nanoparticles that tagged the cuttings as they were generated at the drillbit. These “NanoTags” were tested while drilling in Q4, 2019; and the results indicated that the NanoTags did in fact have the potential to identify some systematic errors compared with traditional mud logging calculations.

Bio:



Martin E. Poitzsch has been Reservoir Engineering Technology Leader in the Aramco Research Center in Cambridge (Boston), USA, since 2014, leading a team applying nanomaterials and related methods to the challenge of improving reservoir surveillance and recovery. Prior to Aramco, he had a 20-year R&D career in Schlumberger, developing new technologies in Logging While Drilling, Wireline, Sensors Research, and SmartWell Completions in Houston, Paris, Connecticut, and Boston. Martin holds a Ph.D. in Physics from Harvard University.